

EXHIBIT 1

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Bakshi et al.

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(45) **Date of Patent:** **May 29, 2012**

(54) **SOFTWARE BASED TRADING TURRET**

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Related U.S. Application Data

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5, 2008.

(51) **Int. Cl.**
H04L 12/66 (2006.01)

(52) **U.S. Cl.** **370/352**; 370/463; 379/156

(58) **Field of Classification Search** 370/352,
370/463; 379/156
See application file for complete search history.

(56) **References Cited**

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* cited by examiner

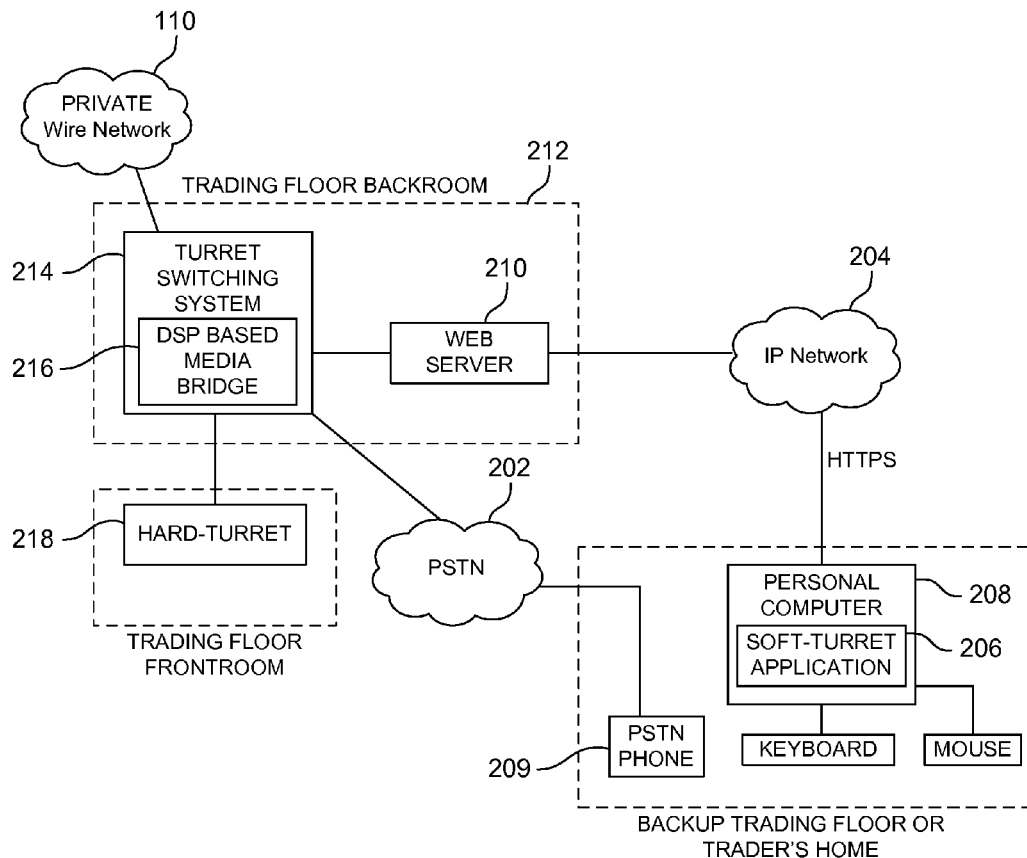
Primary Examiner — Creighton Smith

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Scinto

(57) **ABSTRACT**

A communications system including a turret switching sys-
tem constructed to communicate to a Web server, a turret
device, and to a remote communications device via a first
communications network, the Web server being constructed
to communicate to a client device via a second communica-
tions network, and the client device constructed to control
switching across a plurality of lines.

18 Claims, 9 Drawing Sheets



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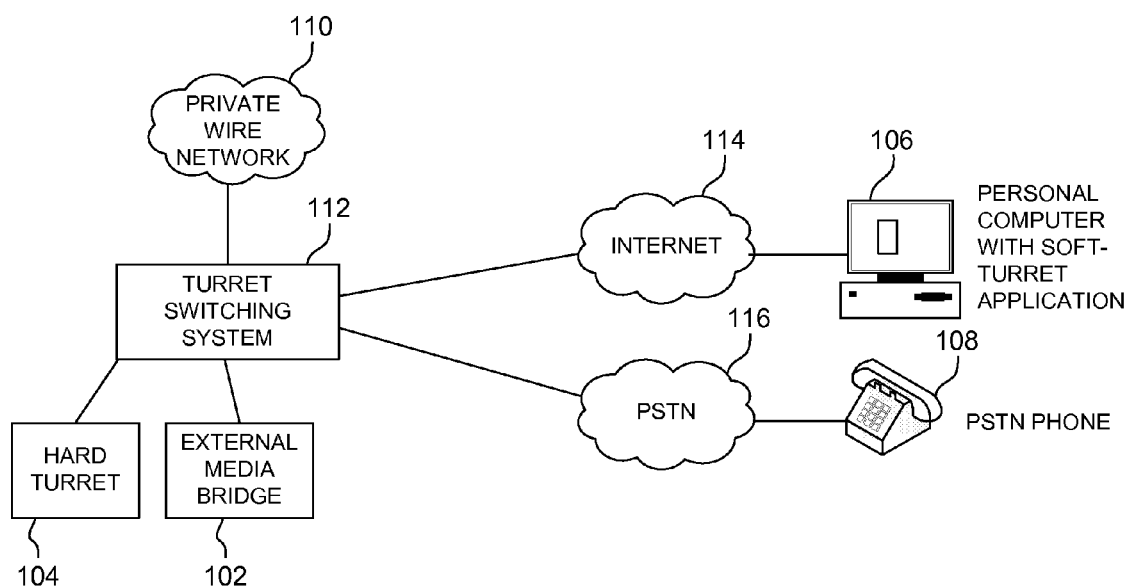


FIG. 1
(PRIOR ART)

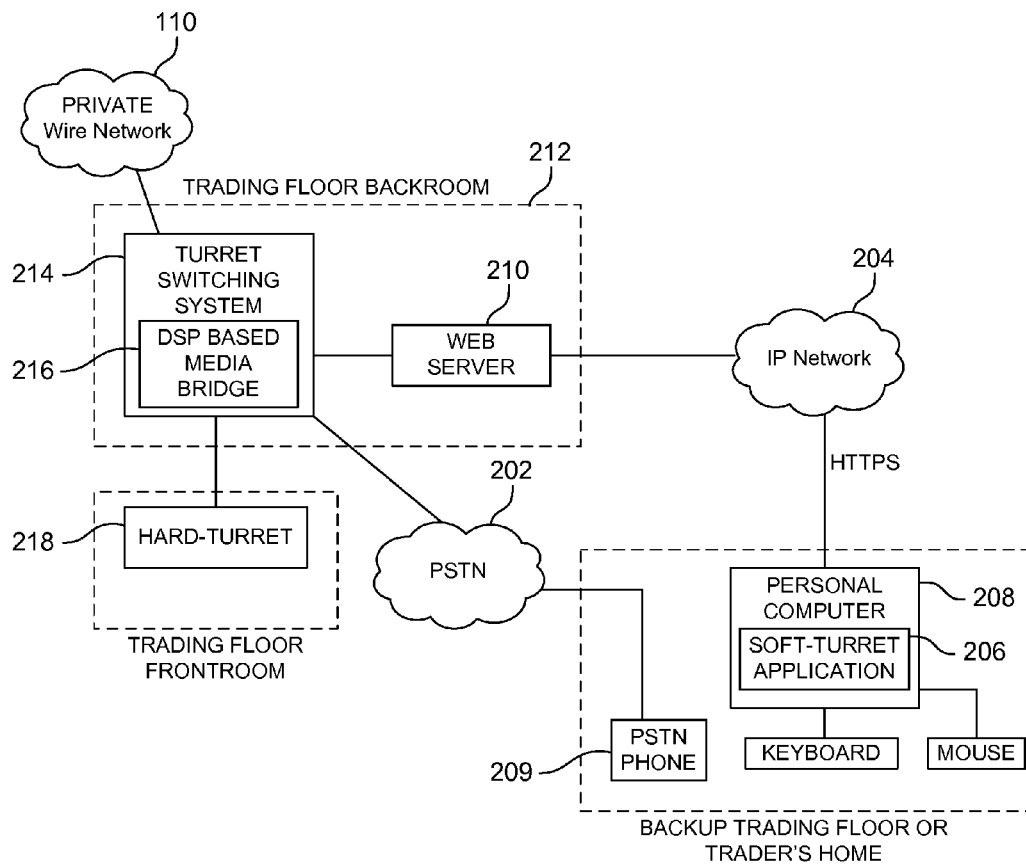


FIG. 2

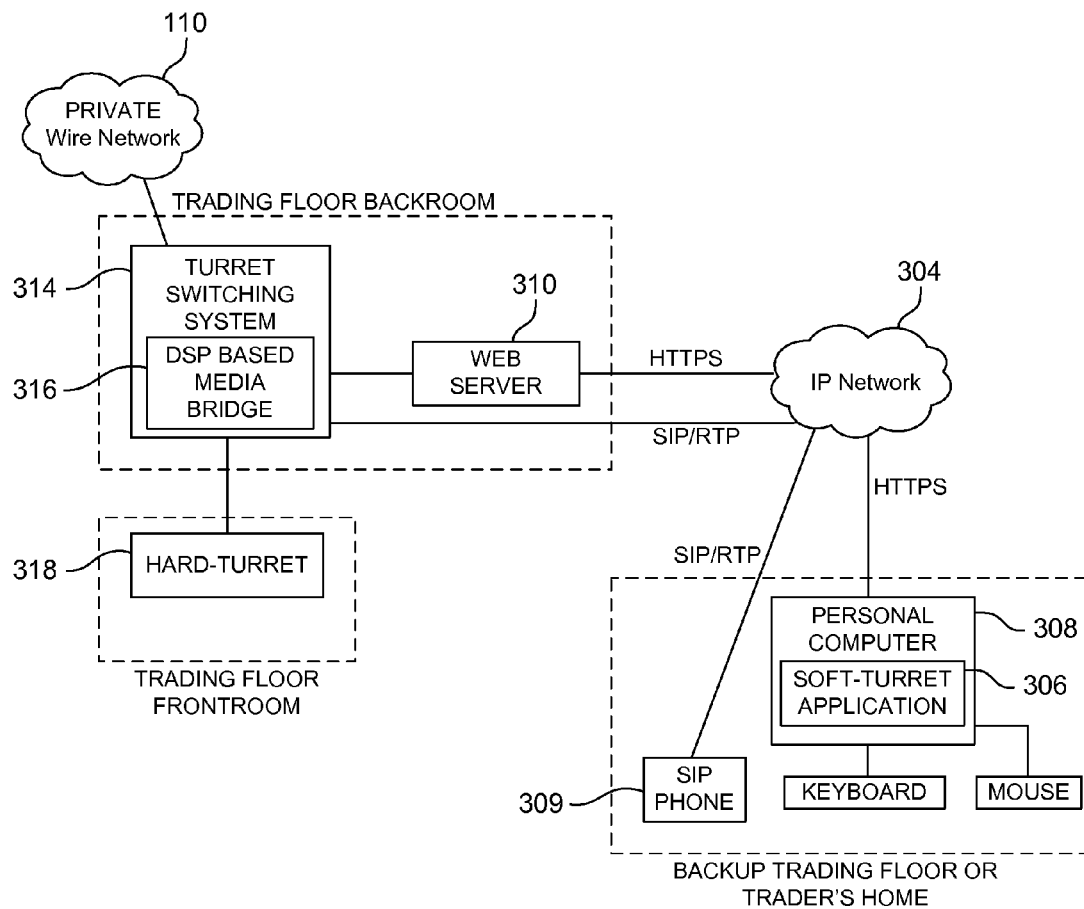


FIG. 3

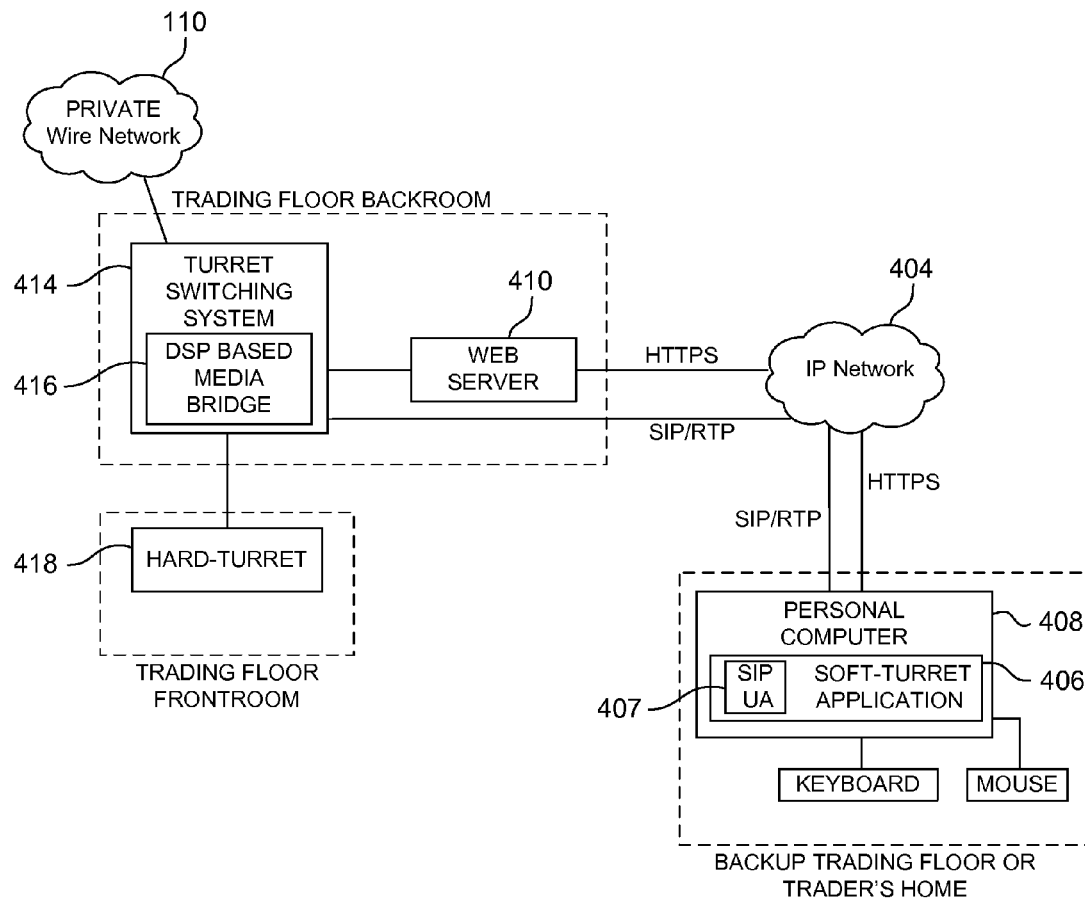
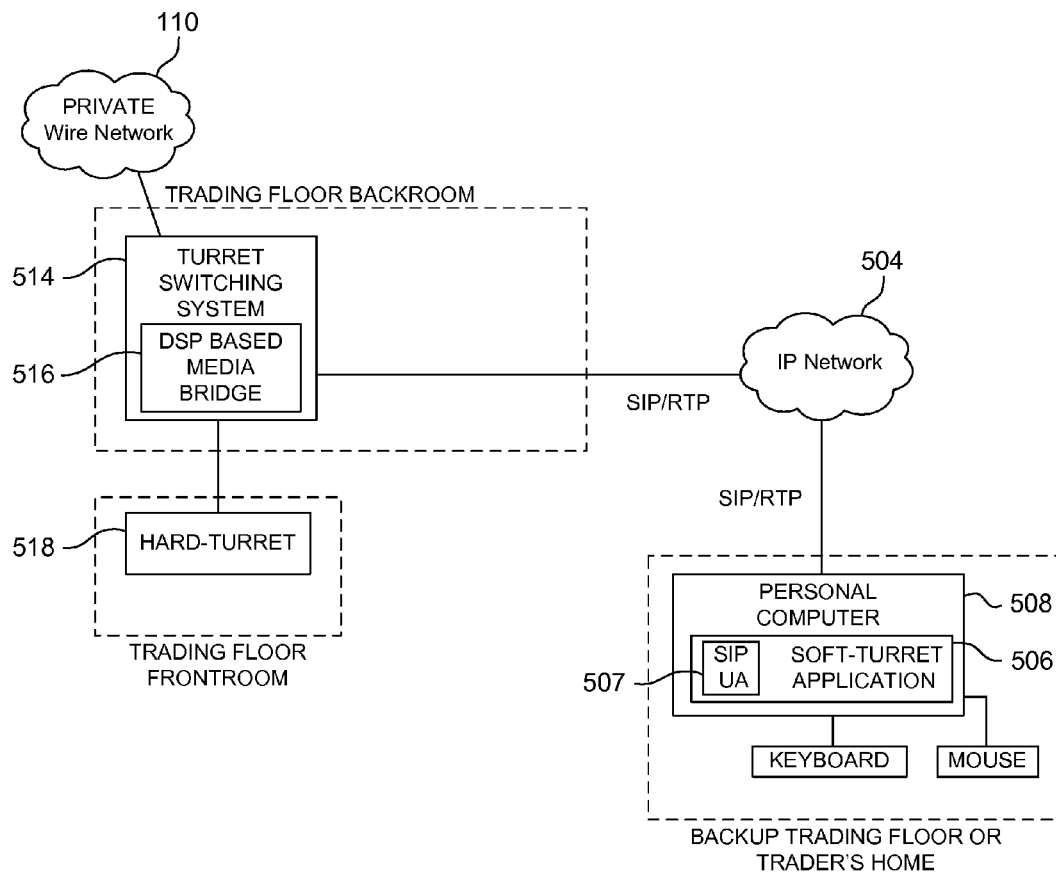


FIG. 4

**FIG. 5**

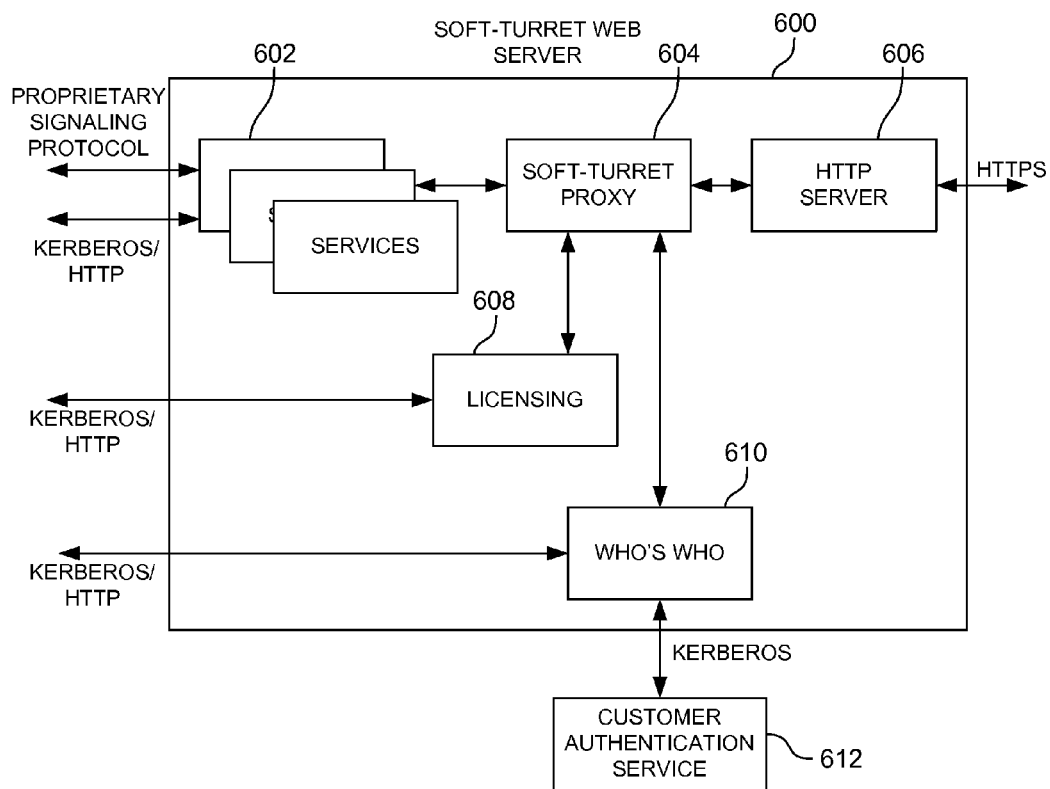
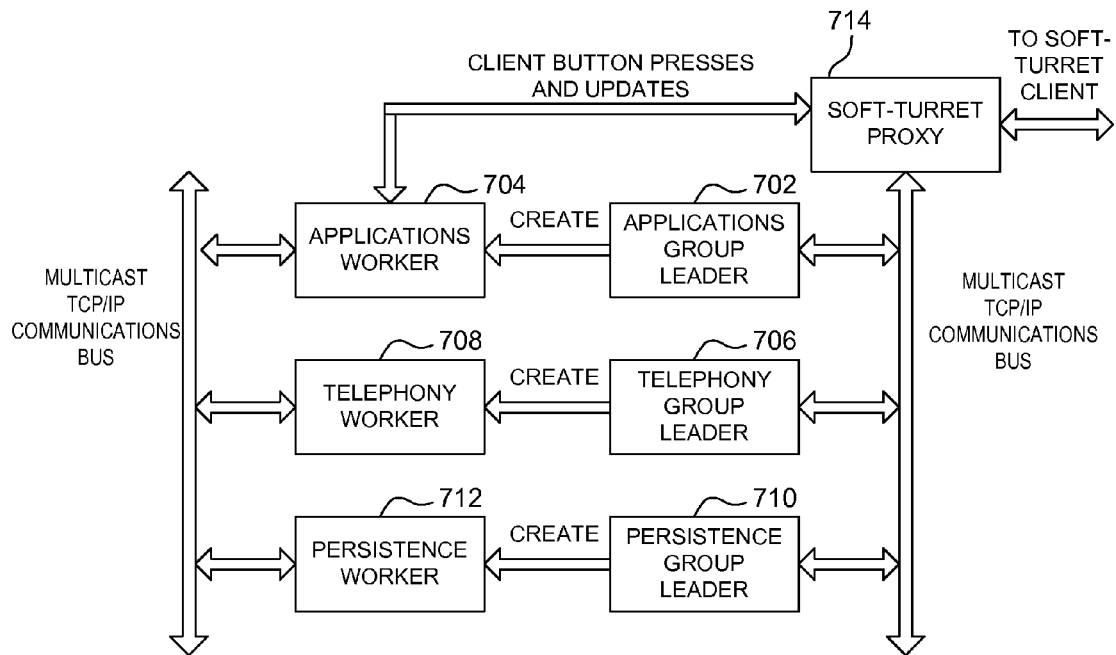


FIG. 6

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US 8,189,566 B2**FIG. 7**

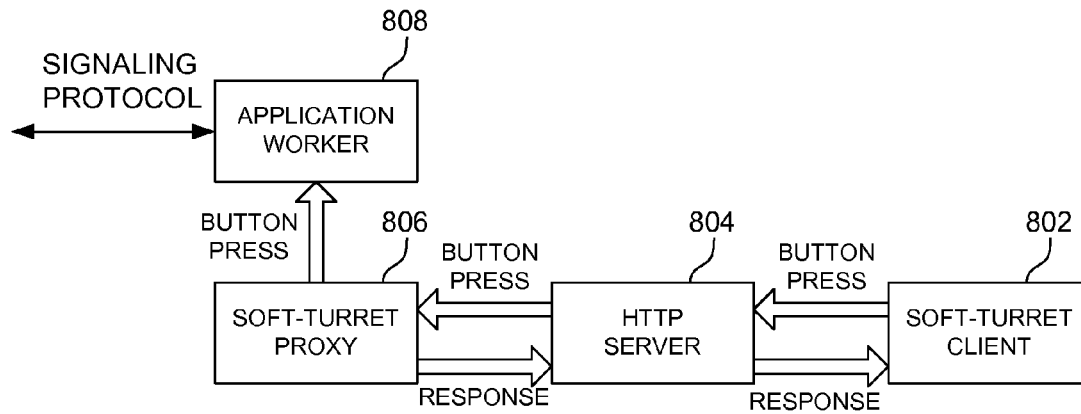


FIG. 8

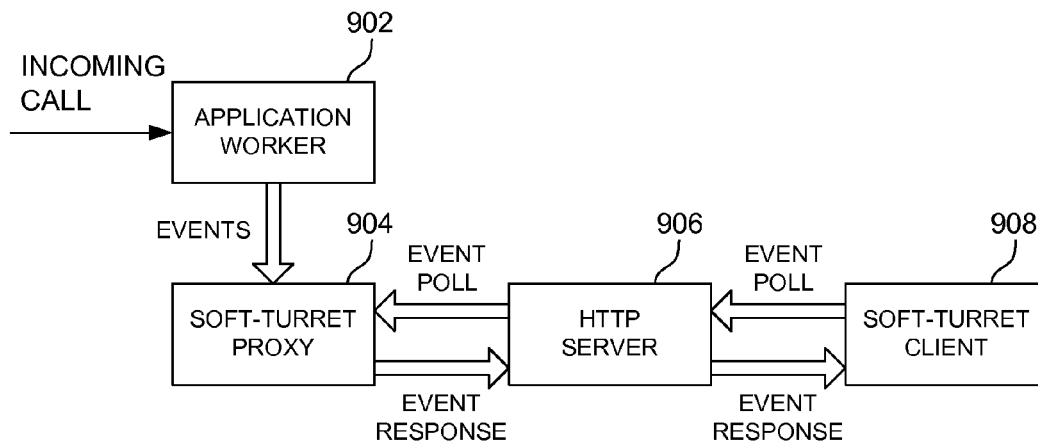
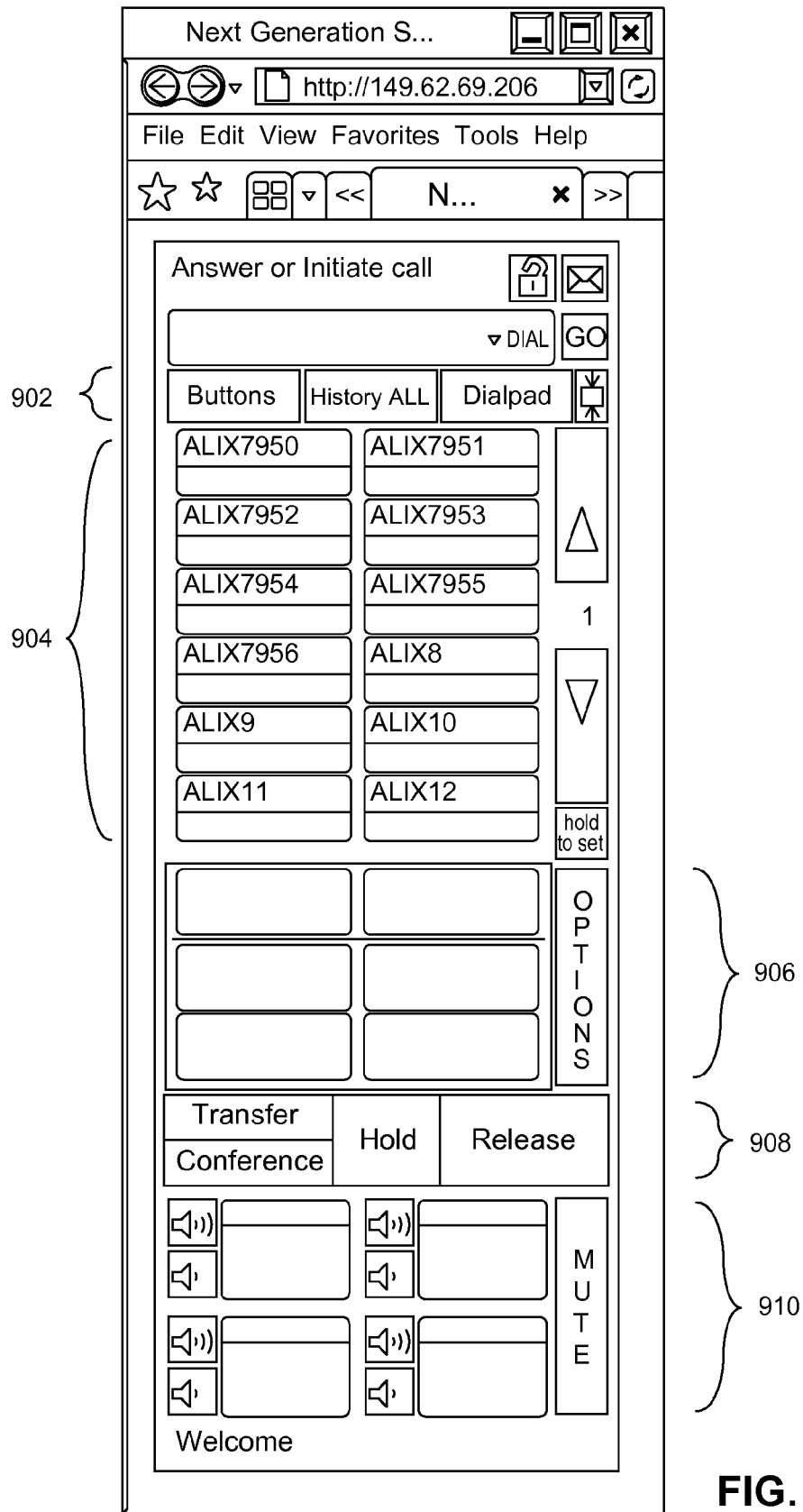


FIG. 9

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SOFTWARE BASED TRADING TURRET**CROSS REFERENCE TO RELATED APPLICATIONS**

This application claims priority to, and the benefit of, U.S. Provisional Patent Application Ser. No. 61/059,143, filed Jun. 5, 2008, which is hereby incorporated by reference in its entirety.

BACKGROUND OF THE INVENTION**1. Field of the Invention**

The present invention generally relates to telecommunication systems, and more particularly to key telephone systems and trading turrets.

2. Description of the Related Art

A trading turret system is a specialized telephony switching system that allows a relatively small number of users to access a large number of external lines and provides enhanced communication features such as hoot-n-holler, push-to-talk, intercom, video and large-scale conferencing. These features are often utilized in the financial industry such as trading floor environments, as well as security/law enforcement, utilities, healthcare, and customer support (e.g., contact centers) environments.

Users interface with a turret switching system through a trading turret device, which can be implemented in dedicated hardware (sometimes referred to as a “hard” turret) or in a general-purpose computer (sometimes referred to as a “soft” turret). A hard-turret is a phone-like desktop device with multiple handsets, speakers and buttons. A soft-turret is a software application that runs on a trader’s desktop personal computer (PC) or on a mobile computer such as a PDA (Personal Digital Assistant). A soft-turret application may be controlled using the native control interface that the computer provides such as a touch screen, stylus, click wheel, or mouse and keyboard. In addition to rendering a graphical image of the turret on the PC screen, the soft-turret application may also provide voice, instant messaging and presence features.

With the introduction of Session Initiation Protocol (“SIP”) based architectures, new features and interoperability with a wide variety of SIP enabled devices is possible. SIP is an application-layer control (i.e., signaling) protocol for creating, modifying, and terminating sessions such as Internet telephony calls with one or more participants and is defined in RFC-3261, “SIP: Session Initiation Protocol”. SIP has been used in typical IP based networks as the predominant way of signaling between stations and telephony systems and as the trunking protocol between telephony systems. SIP also can be used in conjunction with other protocols such as Session Description Protocol “SDP” and Real-Time Protocol “RTP” to provide communications services.

With the advent of Voice over Internet Protocol (“VoIP”), VoIP turret devices have moved from a fixed environment of dedicated voice communications trading resources to a more virtualized and remotely accessible trading environment across multiple sites. This virtual environment allows trader mobility (e.g., to roam across multiple trading floors), and disaster recovery planning and resources (e.g., remote access to their private wires) to be shared dynamically, when and where required, across a global corporate enterprise.

FIG. 1 shows an overview of a previous generation soft-turret product. This system makes use of an external hardware media bridge **102** and a hard-turret **104** for one soft-turret instance to operate. Hard-turret **104** typically includes two handsets, commonly referred to as a Left Handset “LHS” and

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a Right Handset “RHS” and multiple speaker devices. This allows a trader to have many independent voice conversations simultaneously. A soft-turret **106** is typically connected to a turret switching system **112** through a network such as the Internet **114** and is accompanied by a single phone device for voice delivery. Thus, soft-turret users have a single handset only.

To accommodate for this, a typical soft-turret product makes use of the external media bridge **102** to bridge the LHS to RHS so that one channel is used to connect to the private wire network **110** and the other channel is used to connect a public-switched-telephone-network or PSTN phone **108** over a PSTN network **116**. This solution is costly, however, because it requires an external piece of hardware and requires a hard-turret to be dedicated to the remote trader.

Typical soft phones have other practical limitations. For example, a soft-phone runs on a PC and is typically connected to an organization’s private branch exchange (PBX) and makes use of VoIP to communicate with the PBX. In such configurations, the soft-phone can exchange signaling (e.g., SIP) and media (e.g., RTP) with the PBX but does not have a dedicated data channel with the PBX for rendering a display to the user. Soft phones are typically also not capable of delivering multiple conversations (such as multiple handsets and speakers as is the case in turrets) simultaneously.

Another factor that must be taken into consideration when dealing with trader communications is voice quality. Voice quality requirements (such as voice cut-through times) in a trading environment are significantly more stringent than in an enterprise PBX environment. For instance, as soon as a trader seizes a private wire, voice communications must be established immediately (e.g., <50 ms) such that a single spoken syllable from the trader is not dropped.

Another bottleneck in existing trader systems is their computing systems. A trader’s personal computer may be running many voice applications simultaneously such as Voice and Instant Messaging clients, Web browsers with voice enabled Web pages, etc. In addition, the personal computer’s operating system is usually non-real time, which means it is not capable of switching tasks in real time in order to preempt low priority tasks to allow applications delivering voice media to run. Sending the voice to trader’s PSTN (Public Switched Telephone Network) phone line thus presents contention issues.

BRIEF DESCRIPTION

The example embodiments described herein meet the above-identified needs by providing methods, systems and computer-readable medium for providing a software-based trading turret.

In one example embodiment, a turret switching system communicates to a Web server, a turret device, and to a remote communications device via a first communications network. The Web server communicates to a client device via a second communications network. The client device controls switching across a plurality of lines.

In another example embodiment, a computer-readable medium having stored thereon sequences of instructions is provided. The sequences of instructions include instructions which when executed by a computer system causes the computer system to communicate to a Web server, a turret device, and to a remote communications device via a first communications network, communicate to a client device via a second communications network, and control switching across a plurality of lines.

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In yet another example embodiment, a method for providing a software based trading turret is provided by communicating, by a turret switching device, to a Web server, a turret device, and a remote communications device, via a first communications network. The method also provides communicating, by the turret switching device, to a client device via a second communications network; and controlling switching across a plurality of lines, by the turret switching device.

Further features and advantages, as well as the structure and operation, of various example embodiments of the present invention are described in detail below with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 depicts a diagram of a prior art soft-turret system.

FIG. 2 depicts a system for delivering voice and data over separate communications channels in accordance with an embodiment of the present invention.

FIG. 3 depicts a system for delivering voice and data over a single data network, where the voice is delivered over a VoIP network using SIP and RTP protocols, in accordance with an embodiment of the present invention.

FIG. 4 depicts a system for delivering voice and data over a single data network, where a SIP phone is embedded inside soft-turret application, in accordance with an embodiment of the present invention.

FIG. 5 depicts a system for delivering voice and data using only one signaling protocol for employing voice and data sessions, in accordance with an embodiment of the present invention.

FIG. 6 shows the internal software architecture of a soft-turret Web server in accordance with an embodiment of the present invention.

FIG. 7 depicts an exemplary multi-tasking architecture of a soft-turret Web server in accordance with an embodiment of the present invention.

FIG. 8 illustrates an exemplary mechanism of button-press stimulus delivery from a soft-turret client to a server, in accordance with an embodiment of the present invention.

FIG. 9 illustrates an exemplary mechanism of event delivery from a soft-turret server to a client, in accordance with an embodiment of the present invention.

FIG. 10 depicts a screenshot of an exemplary soft-turret launched from within a Web browser on a PC, in accordance with an embodiment of the present invention.

The features and advantages of the example embodiments of the invention presented herein will become more apparent from the detailed description set forth below when taken in conjunction with the drawings in which like reference numbers indicate identical or functionally similar elements.

DETAILED DESCRIPTION

The example embodiments of the invention presented herein are directed to methods, systems and computer-readable medium for a software based trading turret, which are now described herein in terms of an example trading environment and a remote client. This is for convenience only and is not intended to limit the application of the present invention. In fact, after reading the following description, it will be apparent to one skilled in the relevant art(s) how to implement the following invention in alternative embodiments, such as security/law enforcement, utilities, healthcare, and customer support (e.g., contact centers) environments.

Generally, trader mobility and disaster recovery planning are provided by a system having a trading turret modeled as

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two parts. One part renders a turret's Graphical User Interface (GUI) on a PC screen and accepts user stimuli while the other part delivers voice communications to the trader.

A soft-turret application is used to facilitate synchronization of both parts by communicating signaling information to/from a turret switching system over a data network such as the public Internet while voice communications are in progress over the PSTN.

FIG. 2 depicts an arrangement in which voice and signaling are communicated between a turret switching system and a remote client at a backup trading floor or trader's home. Particularly, voice is delivered between a turret switching system **214** connected to a private wire network **110** and a PSTN phone **209** through a PSTN **202**. Data communications that carry signaling such as display-refreshes and button selections (i.e., "presses") are delivered to/from a PC **208** over an IP network **204** such as the Internet.

A soft-turret application **206** running on PC **208** uses a secure form of HTTP (Hyper-Text Transfer Protocol) for exchanging data with a farm of Web servers **210** deployed in a trading floor backroom **212** environment. Soft-turret application **206** can be launched from a Web browser or as a standalone software application. Once launched, soft-turret application **206** renders a turret on the display of the PC **208**, such as one in the trading floor backroom **212**, i.e. hard-turret **218**.

Once soft-turret application **206** has been subscribed to Web server **210**, Web server **210** is enabled to deliver line status change notifications to the soft-turret application **206**. This allows soft-turret application **206** to listen for line state changes from the turret system **214** and ensures that the line states are consistent across both systems. For instance, a user of hard-turret **218** seizes a line located in the trading floor backroom, soft-turret application will receive a corresponding notification. For simplicity only one representative Web server is shown.

Several private lines can be coupled to turret switching network **110**. One or more of these lines can be fed to PSTN phone **209** through PSTN **202** allowing a trader to have multiple independent voice conversations simultaneously. Soft-turret application **206** is enabled to seize lines on the private wire network **110** and perform functions available on a hard-turret **218** from a remote PC **208**. Signaling information associated with the seized lines are communicated to/from the soft-turret application **206**.

For example, soft-turret application **206** can deliver button presses to Web server **210**, which in turn converts them into the communication protocol understood by the station cards installed in the turret switching system **214**. LHS/RHS bridging is performed inside media bridge **216**, eliminating the need for an external media bridge or a dedicated hard-turret.

By enabling turret switching system **214** to connect multiple lines on a private wire network **110** to a single PSTN phone **209**, a user can communicate to multiple parties that have been remotely connected by turret switching system **214** under the control of a remote client (e.g., PC **208**). This permits signaling information and voice connections to be synchronized.

FIG. 3 depicts a variation of the embodiment described above with respect to FIG. 1. In this arrangement, voice is delivered over a VoIP network using SIP and RTP protocols as opposed to over a PSTN. Particularly, turret switching system **314** delivers voice between a private wire network **110** and a SIP phone **309** via an IP network **304** (e.g., Internet).

Data communications that carry information from a PC **308**, such as display refreshes and button selections (i.e., "presses") also are delivered over IP network **304**. Particu-

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larly, a soft-turret application 306, running on a PC 308 uses a secure form of HTTP (Hyper-Text Transfer Protocol) for exchanging data with a farm of Web servers 310 deployed in the trading floor backroom 312. The soft-turret application 306 may be launched from either within a Web browser or as a standalone software application.

Once soft-turret application 306 has been subscribed to Web server 310, Web server 310 is enabled to deliver line status change notifications to the soft-turret 306. This allows soft-turret application 306 to listen for line state changes from the turret system 314 and ensures that the line states are consistent across both systems. For instance, a user of hard-turret 318 seizes a line located in the trading floor backroom, soft-turret application will receive a corresponding notification.

As described above, several private lines can be coupled to turret switching network 110. These lines can be fed to SIP phone 309 by the turret switching system 314 through IP network 304 allowing a trader to have multiple independent voice conversations simultaneously. In addition, soft-turret application 306 is enabled to seize lines on the private wire network 110 and perform functions available on a hard-turret 318 from a remote PC 308. Signaling information associated with the seized lines is communicated to/from the soft-turret application 306.

For example, soft-turret application 306 can deliver button presses to Web server 310, which in turn converts them into the communication protocol understood by the station cards installed in the turret switching system 314. LHS/RHS bridging is performed inside media bridge 316, eliminating the need for an external media bridge or a dedicated hard-turret.

By enabling turret switching system 314 to connect multiple lines on a private wire network 110 to a single SIP phone 309, a user can communicate to multiple parties that have been remotely connected by turret switching system 314 under the control of a remote client (e.g., PC 308). This configuration thus provides real-time synchronization of the voice and signaling data by separating each into two channels and communicating both channels over an IP network 404.

FIG. 4 depicts a system for delivering voice and data communications over a single network, IP network 404. In this embodiment, a SIP phone is embedded inside a soft-turret application 406 running, for example, on a PC 408. Soft-turret application 406 uses a SIP user agent ("UA") 407 to initiate and answer calls. The display refreshes and button selections are delivered over HTTP.

Voice communications are delivered over a VoIP network using SIP and RTP protocols while the data communications such as display refreshes and button selections are delivered using a secure form of HTTP (e.g., HTTPS).

The soft-turret application 406 in this embodiment may be launched from either within a Web browser or as a standalone software application. The Web server 410 delivers line status change notifications to the soft-turret 406, and the soft-turret 406 delivers button presses to the Web server 410. Web server 410, in turn, converts user button press commands into a proprietary communication protocol understood by the station cards installed in the turret switching system 414. In this example, instead of using a PSTN or SIP hard-phone, a trader uses a microphone and speaker(s) connected to PC 408 to exchange voice with the private wire network 110.

Once soft-turret application 406 has been subscribed to Web server 410, Web server 410 is enabled to deliver line status change notifications to the soft-turret application 406. This allows soft-turret application 406 to listen for line state changes from the turret system 414 and ensures that the line states are consistent across both systems. For instance, a user

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of hard-turret 418 seizes a line located in the trading floor backroom, soft-turret application will receive a corresponding notification. For simplicity only one representative Web server is shown.

Several private lines can be coupled to turret switching network 110. One or more of these lines can be fed to SIP UA 407 through IP network 404 allowing a trader to have multiple independent voice conversations simultaneously. Soft-turret 406 is enabled to seize lines on the private wire network 110 and perform functions available on a hard-turret 418 from a remote PC 408. Signaling information associated with the seized lines are communicated to/from the soft-turret application 406.

For example, soft-turret application 406 can deliver button presses to Web server 410, which in turn converts them into the communication protocol understood by the station cards installed in the turret switching system 414. LHS/RHS bridging is performed inside media bridge 416, eliminating the need for an external media bridge or a dedicated hard-turret.

By enabling turret switching system 414 to connect multiple lines on a private wire network 110 to a single SIP UA 407, a user can communicate to multiple parties that have been remotely connected by turret switching system 414 under the control of a remote client (e.g., PC 408). This permits signaling information and voice connections to be synchronized.

FIG. 5 depicts a system for delivering voice and data using only one signaling protocol for employing voice and data sessions. By employing one signaling protocol for voice and data sessions a converged client is provided. Particularly, no separate data channel (e.g., HTTPS) is required; only SIP/RTP communications are used. Particularly, line status notifications and button presses are delivered as SIP messages and line status notifications and button press requests that were previously delivered over HTTPS are now also delivered over SIP.

Referring still to FIG. 5, a system for delivering voice and data over a single data network, where a SIP phone is embedded inside soft-turret application, is shown. In this embodiment, a trader uses a PC 508 running a soft-turret application 506 for both voice communications and data. Soft-turret application 506 includes a SIP UA 507 to initiate and answer calls between peers. Voice is delivered from PC 508 to a turret switching system 514 over IP network 504 using SIP and RTP protocols. The soft-turret application 506 may be launched from either within a Web browser or as a standalone software application.

Turret switching system 514 delivers line status change notifications to the soft-turret 506, and the soft-turret 506 delivers button presses to the turret switching system 514. In this embodiment, user button press commands are constructed such that they are understood by the station cards installed in the turret switching system 514. A trader use a microphone and speakers connected to the PC 508 to exchange voice.

As illustrated above, none of the embodiments require an external media bridge or a dedicated hard-turret. Instead, LHS/RHS bridging is now done inside a DSP based media bridge placed on the station card through which turret stations connect to the switching fabric. In addition, once a trader is logged in, a communication channel to the PSTN phone, SIP phone, UA, as the case may be, is established. Whether and which line (e.g., from private wire network 110) is communicated to the soft-turret is controlled by the soft-turret application.

FIG. 6 depicts the internal software architecture of an example soft-turret Web server 600 in more detail. As shown

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in FIG. 6, the architecture employs an HTTP server **606** for terminating the HTTP protocol and for serving Web pages. Soft-turret Web server **600** also includes a soft-turret proxy **604** which collects messages communicated over the HTTP protocol and, in turn, communicates them to one or more services **602**. A Who's Who component **610** allows a trader to login using, for example, an alphanumeric AoR (Address of Record) as opposed to a numeric TRID (Trader ID). The Who's Who component **610** may also be in communication with a customer authentication server **612** which provides authentication services. This allows soft-turret Web server **600** to utilize customer authentication service **612** using, for example, the Kerberos protocol to facilitate trader log-on. The Kerberos protocol can also be used to encrypt communications between the soft-turret Web server and the turret switching system.

As described above with respect to FIGS. 2-5, the same functionality previously performed on a hard turret is now performed on a soft-turret. When stimulus from a soft-turret is received by HTTP server **606** via a network (e.g., the public Internet) the stimulus is communicated to soft-turret proxy **604**. Soft-turret proxy **604**, in turn, directs this signaling to either a service **602**, a licensing processor **608** or a Who's Who processor **610**.

Services provide signaling and other information such as authentication information to the turret switching system (e.g., **214**, **314**, **414**, **514**).

In addition, soft-turret Web server **600** can include a licensing component **608** to facilitate authentication. For example licensing component **608** can limit the number of users that are able to login into and use the system, for example based on a predetermined number of allowed users.

The soft-turret Web server also includes several application tasks or processes modules. A single soft-turret web server can support hundreds of simultaneous client connections and each client connection is supported through a set of processes that are run on the operating system.

FIG. 7 illustrates an example flow of various tasks involved in soft-turret Web server operations. As shown in FIG. 7, signaling can be received from a soft-turret client via a soft-turret proxy **714**. In turn, soft-turret proxy **714** communicates the signaling to one or more services, such as an applications worker **704**, telephony worker **708** and persistence worker **712**. Particularly, the group leader of each worker (i.e., an applications group leader **702**, a telephony group leader **706** and a persistence group leader, respectively) create their respective workers. Signaling information from the workers, in turn is communicated back to the soft-turret application through soft-turret proxy **714**.

FIG. 8 illustrates an exemplary mechanism of button-press stimulus delivery from a soft-turret client to a server. In this example, a user of a soft-turret client **802** selects a button, such as a button to answer a line. The button data associated with the selection is communicated from the PC to an HTTP server **804**, which in turn communicates the data to a soft-turret proxy **806**. Soft-turret proxy **806** forwards the data to one or more services. A service, such as an application worker **808**, communicates the data to a turret switching system using an appropriate signaling protocol.

FIG. 9 illustrates an exemplary mechanism of event delivery from a soft-turret server to a client. In this example, signaling information about an incoming call is communicated to an application worker **902**. A soft-turret client **908** polls an HTTP server **906** for line status change events. HTTP server, in turn, forwards the event poll to a soft-turret proxy **904**. The HTTP poll requests are pending at the server until a line state change occurs. As soon as a line state change occurs,

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the server returns a response to the client, therefore, providing a real-time state change delivery mechanism. This response contains the specific information about line state changes. This technique is commonly known as HTTP long-poll or "Comet".

Events are communicated by the application worker **902** to the soft-turret proxy **904**, which, in turn, communicates an event response to an HTTP server **906**. The events are accepted and queued within the HTTP server so they can be dispatched to clients in batches. HTTP server **906** communicates the event response to a soft-turret client **908**.

FIG. 10 depicts a screenshot of an exemplary soft-turret launched from within a Web browser on a PC, in accordance with an embodiment of the present invention. As shown in FIG. 10, various sets of buttons and indicators are provided (**902**, **904**, **906**, **908**, **910**). These buttons and indicators provide the same features found on a hard turret, such as turrets **218**, **318**, **418** and **518** described above with respect to FIGS. 2-5, which are typically found on a trading floor. For example, a dialpad button **902** provides a user with a set of numbers used to make a call, and multiple lines can be selected through buttons **904**. The same options available on the physical hard turret also are available on the GUI of the soft-turret through the options set of buttons **906**. Similarly, transferring, conferencing, hold, release and mute button features are signaled through the GUI using button sets **908** and **910**, respectively.

Synchronization of the voice and signaling data is achieved by seizing a voice line between a PSTN phone, a SIP phone or a SIP UA, as the case may be and communicating control and status data on a separate channel. Multiple lines, for example on a private wire network, may be bridged by a turret switching system. Similarly, the LHS and RHS may be bridged through a media bridge within the turret switching system.

A conference including of these voice lines may be provided on the seized line between the turret switching system and the remote phone, with the control and status (i.e., signaling) being communicated through a separate channel between a soft-turret application and a web server in communication with the turret switching system, using a GUI such as the one shown in FIG. 10.

The example embodiments of the invention may be implemented using hardware, software or a combination thereof and may be implemented in one or more computer systems or other processing systems. However, the manipulations performed by these example embodiments were often referred to in terms, such as entering, which are commonly associated with mental operations performed by a human operator. No such capability of a human operator is necessary, in any of the operations described herein. Rather, the operations may be completely implemented with machine operations. Useful machines for performing the operation of the example embodiments presented herein include general purpose digital computers or similar devices.

From a hardware standpoint, a CPU typically includes one or more components, such as one or more microprocessors, for performing the arithmetic and/or logical operations required for program execution, and storage media, such as one or more disk drives or memory cards (e.g., flash memory) for program and data storage, and a random access memory, for temporary data and program instruction storage. From a software standpoint, a CPU typically includes software resident on a storage media (e.g., a disk drive or memory card), which, when executed, directs the CPU in performing transmission and reception functions. The CPU software may run on an operating system stored on the storage media, such as, for example, UNIX or Windows (e.g., NT, XP, Vista), Linux, and the like, and can adhere to various protocols such as the

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Ethernet, ATM, TCP/IP protocols and/or other connection or connectionless protocols. As is well known in the art, CPUs can run different operating systems, and can contain different types of software, each type devoted to a different function, such as handling and managing data/information from a particular source, or transforming data/information from one format into another format. It should thus be clear that the embodiments described herein are not to be construed as being limited for use with any particular type of server computer, and that any other suitable type of device for facilitating the exchange and storage of information may be employed instead.

A CPU may be a single CPU, or may include plural separate CPUs, wherein each is dedicated to a separate application, such as, for example, a data application, a voice application, and a video application. Software embodiments of the example embodiments presented herein may be provided as a computer program product, or software, that may include an article of manufacture on a machine accessible or computer-readable medium (i.e., also referred to as "machine readable medium") having instructions. The instructions on the machine accessible or machine readable medium may be used to program a computer system or other electronic device. The machine-readable medium may include, but is not limited to, floppy diskettes, optical disks, CD-ROMs, and magneto-optical disks or other type of media/machine-readable medium suitable for storing or transmitting electronic instructions. The techniques described herein are not limited to any particular software configuration. They may find applicability in any computing or processing environment. The terms "machine accessible medium", "machine readable medium" and "computer-readable medium" used herein shall include any medium that is capable of storing, encoding, or transmitting a sequence of instructions for execution by the machine (e.g., a CPU or other type of processing device) and that cause the machine to perform any one of the methods described herein. Furthermore, it is common in the art to speak of software, in one form or another (e.g., program, procedure, process, application, module, unit, logic, and so on) as taking an action or causing a result. Such expressions are merely a shorthand way of stating that the execution of the software by a processing system causes the processor to perform an action to produce a result.

While various example embodiments of the present invention have been described above, it should be understood that they have been presented by way of example, and not limitation. It will be apparent to persons skilled in the relevant art(s) that various changes in form and detail can be made therein. Thus, the present invention should not be limited by any of the above described example embodiments, but should be defined only in accordance with the following claims and their equivalents.

In addition, it should be understood that the figures are presented for example purposes only. The architecture of the example embodiments presented herein is sufficiently flexible and configurable, such that it may be utilized (and navigated) in ways other than that shown in the accompanying figures. It is also to be understood that the procedures recited in the claims need not be performed in the order presented.

What is claimed is:

1. A communications system, comprising:

a turret switching system constructed to communicate to a Web server, a turret device, and to a remote communications device via a first communications network, the Web server being constructed to communicate to a client

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device via a second communications network, and the client device constructed to control switching across a plurality of lines; and

an interface having a button sheet corresponding to a plurality of line selectors and constructed to seize a corresponding line by causing the client device to communicate a predetermined message to the turret switching system over the second communications network.

2. The communications system according to claim 1, wherein the first communications network is a PSTN network and the remote communications device is a PSTN device.

3. The communications system according to claim 1, wherein the corresponding line is communicatively coupled to the communications device via the first communications network upon selection of one of the plurality of line selectors.

4. The communications system according to claim 1, wherein the predetermined message is communicated over the second communications network using SIP.

5. The communications system according to claim 1, wherein switching of the corresponding line is performed in the turret switching system.

6. The communications system according to claim 1, wherein the first communications network and the second communications network are IP networks.

7. A non-transitory computer-readable medium having stored thereon sequences of instructions, the sequences of instructions including instructions which when executed by a computer system causes the computer system to:

communicate to a Web server, a turret device, and to a remote communications device via a first communications network;

communicate to a client device via a second communications network;

control switching across a plurality of lines; and

seize a corresponding line by causing the client device to communicate a predetermined message to a turret switching system over the second communications network.

8. The non-transitory computer-readable medium of claim 7, wherein the first communications network is a PSTN network and the remote communications device is a PSTN device.

9. The non-transitory computer-readable medium of claim 7, wherein the corresponding line is communicatively coupled to the communications device via the first communications network upon selection of one of a plurality of line selectors.

10. The non-transitory computer-readable medium of claim 7, wherein the predetermined message is communicated over the second communications network using SIP.

11. The non-transitory computer-readable medium of claim 7, wherein switching of the corresponding line is performed in the turret switching system.

12. The non-transitory computer-readable medium of claim 7, wherein the first communications network and the second communications network are IP networks.

13. A method for providing a software based trading turret, comprising the steps of:

communicating, by a turret switching device, to a Web server, a turret device, and a remote communications device, via a first communications network;

communicating, by the turret switching device, to a client device via a second communications network;

controlling switching across a plurality of lines, by the turret switching device; and

US 8,189,566 B2

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seizing a corresponding line by communicating a predetermined message to a turret switching system over the second communications network.

14. The method of claim **13**, wherein the first communications network is a PSTN network and the remote communications device is a PSTN device.

15. The method of claim **13**, wherein the corresponding line is communicatively coupled to the communications device via the first communications network upon selection of one of a plurality of line selectors.

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16. The method of claim **13**, wherein the predetermined message is communicated over the second communications network using SIP.

17. The method of claim **13**, wherein switching of the corresponding line is performed in the turret switching system.

18. The method of claim **13**, wherein the first communications network and the second communications network are IP networks.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 8,189,566 B2
APPLICATION NO. : 12/476490
DATED : May 29, 2012
INVENTOR(S) : Aseem Bakshi et al.

Page 1 of 2

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In the Specification

COLUMN 1:

Line 64, “us” should read --use--.

COLUMN 2:

Line 62, “causes” should read --cause--.

COLUMN 4:

Line 44, “are” should read --is--.

COLUMN 5:

Line 12, “instance,” should read --instance, when--.

COLUMN 6:

Line 12, “are” should read --is--; and

Line 53, “use” should read --uses--.

COLUMN 7:

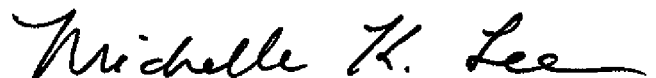
Line 34, “processes” should read --process--; and

Line 38, “and” should read --an--.

COLUMN 8:

Line 34, “of” should be deleted.

Signed and Sealed this
Fifteenth Day of April, 2014



Michelle K. Lee
Deputy Director of the United States Patent and Trademark Office

CERTIFICATE OF CORRECTION (continued)

Page 2 of 2

U.S. Pat. No. 8,189,566 B2

In the Claims

COLUMN 10:

Claim 7, Line 30, “causes” should read --cause--.

EXHIBIT

2

WebRTC in the Financial Sector – An Interview with Leo Papadopoulos from Cloud9 Technologies

June 22, 2015 / in [Markets & People](#), [VoIP](#) / [Add Comment](#)

WebRTC is perceived by many as a technology that allows for in-browser, zero download, voice and video communication. While this is true, it is also an open source media engine that can be used in different ways. Cloud9 Technologies uses WebRTC with a twist. This is because of 2 reasons: their application and the market in which they operate.

Leo Papadopoulos is CTO & Technology Evangelist for Cloud9 Technologies. We both know each other from our previous business life so I asked him to share the details of how they used WebRTC and other technologies for building their service.



Q. What is Cloud9 Technologies all about?

We see ourselves as pioneers in delivering next generation, high performance Cloud Communications Services for targeted segments of the B2B market. We specifically focus on segments that need reliability, security, compliance, and superior support. Our early adopters are financial institutions and the voice and messaging services used by institutional

traders, called trader voice. The Cloud9 (c9tec) solution lets firms transition from expensive, propriety hardware and private networks to applications deployed on commercially available devices. We deliver this as a service with an easy to understand and deploy SaaS business model.

Q. How do you make use of WebRTC in your service, what was your main reason to select this technology?

We wanted to focus on our application and we needed a voice engine. We looked at traditional stacks like SIP but they were way too stringent, required expensive and inflexible application servers, forced us to use signaling that simply did not meet our needs, and did not include the actual voice engine itself. We quickly realized that all the existing protocols were really just variants of old telephony protocols. Quite simply, you cannot develop modern communications services using protocols made to simulate phone lines.

We looked at WebRTC. It allowed voice & video connections, it included methods for ICE/STUN/TURN, it included SRTP for secure voice, it included OPUS which is a modern voice CODEC, and importantly it did *not* force us to use a predefined signaling protocol. It was almost as if someone designed this just for us.

We compiled WebRTC into our application much like the browser manufacturers do. However, it is on top of this that we added our intellectual property that allows us to deliver the unique and special needs of our customers. We layered in a user interface specific to our customers. Reliability and automatic recovery to keep communications continuous. Instrumentation that allows us to deliver proactive support, along with compliance features that regulatory agencies require of our customers, and many more features.



Q. Your use of WebRTC is not common, you have decided not to benefit from the zero download option and compile it into your application. What are the reasons for this decision and do you see this changing in the future?

Most of the attention that WebRTC gets comes from companies that provide toolkits and APIs and also obviously a lot of focus on call centers. We would characterize these opportunities as consumer oriented or B2C at best. That environment has a higher tolerance for browser based solutions and modest support levels and reliability.

Our business focus is the enterprise and B2B services. So when we looked at WebRTC, we said this is cool but how can we make it work at an enterprise level? We've done that and it is one of the things that distinguishes Cloud9.

As for the zero download option – our view is that browsers are disposable and

not suitable for an enterprise grade B2B service. They are a great option for remote access but if you really want to deliver a service to a high end clientele it needs to be packaged in an application with the performance, service levels and support expected by Fortune 100 companies. This is particularly true for our target markets.

Q. What are you using for signaling on top of WebRTC?

Just like a lot of the WebRTC community we use a WebSocket server for signaling. We implement this using a Node.js server which has amazing performance. The actual signaling that we use is proprietary and is part of what makes our application special. It is within this signaling that we take some historically very complex features and implement them in a new much simpler method. This would have been impossible to do using traditional VoIP signaling protocols. However, the combination of WebSockets and Node.js unleash amazing new power.

Q. What technologies are you using in your backend?

There are many technologies available to developers today. The only thing holding anyone back is imagination. Putting these tools together in the right way and adding your own 'special sauce' will lead to success. Here are just some of the tools in our toolbox:

- Voice/Video Engine – WebRTC, OPUS, VP9
- Web services and signaling – HTML5, WebSocket, Apache, Node.js
- Development – C#, .NET, jQuery, PHP, MySQL, C++, Visual Studio
- Amazon Web Services – EC2, VPC, S3, RDS, Route 53, CloudWatch, SNS, IAM, & more.

We think this is pretty cool. You can build and deploy a high performance global communication solution without ever talking to a carrier or telecommunications equipment provider.

You could not do that even 10 years ago. In today's world if you are building your

own infrastructure, then you're probably not investing enough on your service or application and that means that someone else will probably beat you in the market. The tools are there and we all must use them.

Q. Are you using any 3rd party services behind the scenes?

We are using:

- Amazon Web Services for all our servers, storage, and databases.
- Twilio for global SMS messaging.

We are also investigating Microsoft Azure because they seem to have some really nice new products that allow for much better solutions for secure encrypted storage in the cloud.

Q. What would you want to see coming into WebRTC as roadmap?

I think for us the most important thing for WebRTC is voice quality and reliability. To this end here are a few specific features we would like to see:

- 5msec packet support, for codecs that support it, including 5msec audio frame support for AEC, noise reduction, etc. More than the CODEC all the audio algorithms should support small packets for latency critical environments.
- RTCP-XR VoIP metric and statistics summary block report support. This allows us to better deliver superior support to our customers by seeing their problems before they do.
- Customizable audio filters, for example a multiband EQ.
- Configurable STUN ping period. The default period is too fast and uses too much bandwidth and CPU as a result. This has been **addressed at the last IETF meeting** but hasn't been finalized and guidelines have not been published yet.

Q. Any future plans for Cloud9 Technologies you would

want to share?

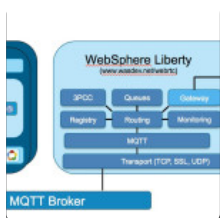
We see a very broad opportunity for WebRTC. In fact we think it's transformational and will ultimately change the way you think about communications and messaging and everything from browsers and call centers to the very way you make a call or message with your cell phone.

For Cloud9:

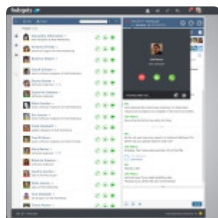
- Our focus is on the high end of the B2B market where service levels and performance matter.
- Our services are designed for work groups and teams, as well as individuals. Team engagement and collaboration is a key part of any enterprise. Technologies like WebRTC let companies like Cloud9 deliver secure and compliant services in today's mobile and global environment.

We support team collaboration both within and between enterprises. Much attention has been placed on collaboration within an enterprise but many of these services miss the mark when it comes to engagement between companies. We think this is a largely underserved market opportunity and look to leverage WebRTC and Cloud services to transform the way business counterparties connect and communicate.

You may also like:



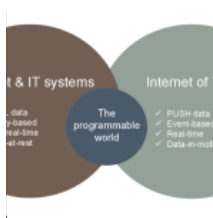
IBM WebSphere and WebRTC – An Interview with Brian Pulito from IBM



WebRTC Based UC for Service Providers – An Interview with Elena Carstoiu from 4PSA



OpenWebRTC: An Interview with Stefan Alund



An Interview with Veselin Pizurica from waylay.io

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EXHIBIT

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Trade Secrets Policy

An important part of the success and value of IPC's business is contained in its confidential business information and trade secrets. It is very important that all employees take appropriate care to protect such confidential business information and trade secrets to ensure that:

- they do not end up in the possession of third parties that should not have access to them, such as competitors
- they do not become public knowledge and therefore lose the protection granted by applicable laws
- all uses of confidential information and trade secrets are necessary and appropriate for the business interests of IPC

For the purposes of this Policy references to employees shall include consultants and contractors.

IPC takes the protection of its confidential business information and trade secrets very seriously. In addition to any obligations imposed by applicable law, IPC requires all employees to agree to confidentiality and non-disclosure obligations, whether contained in an employment agreement or a separate agreement. In addition to these obligations, employees are required to comply with the spirit and the letter of this Policy.

IPC employees who fail to comply with this policy may be subject to disciplinary procedures, up to and including termination of employment from IPC. In addition, IPC will pursue any and all remedies against the employee available to it under applicable laws where there has been misuse of trade secrets or confidential information.

Any breach of this Policy or any other obligations, policies and/or procedures relating to trade secrets and/or confidential information, may cause substantial and irreparable harm to IPC. To the extent permitted by applicable law, IPC may seek injunctive relief and any other relief that it deems necessary and appropriate under the circumstances to protect its rights.

What Constitutes Trade Secrets and Confidential Business Information

In the US under federal and state law, a trade secret is generally any formula, pattern, device or compilation of information that (i) is used in a business, (ii) is unknown to others outside that business, (iii) gives the business a competitive advantage, and (iv) is the subject of reasonable efforts to maintain its secrecy. A trade secret does not have to be unique or novel; it need only provide a distinct economic value to IPC. Confidential business information includes trade secrets as well as other proprietary information that may not rise to the level of a trade secret. Trade secrets and confidential business information may be defined differently depending on the jurisdiction and IPC will always seek the maximum protection of its business afforded by the local courts.

The following is a non-exhaustive list of items that qualify as IPC trade secrets and/or confidential business information:

- IPC customer lists
- The names and qualifications of IPC's development partners and/or contractors

- Any aspect or description of IPC's relationships with its customers, for example, product or service purchases, pricing policies, price lists, discounts, orders and revenue
- Computer systems, software (object code and source code) and databases
- Internal specifications, technical processes, testing procedures, diagrams, designs, drawings, models, and any other techniques, developments, improvements, inventions, and processes that are, or may be, produced in the course of IPC's engineering or other operations
- Marketing development and research plans
- Manufacturing processes or techniques
- Financial, accounting, and legal information
- Any other information not generally and publicly known regarding IPC or its operations, products, suppliers, markets, sales, costs, profits or customers, or other information acquired, disclosed or made known to any employees or agents during the course of their employment or agency that, if used or disclosed, could adversely affect IPC's business or give its competitors a commercial or economic advantage.

Information will not be regarded as trade secrets and/or confidential information if such information:

- is available in the public domain (provided this has not happened because of a breach of any obligations regarding confidentiality or trade secrets)
- was independently created by a third party
- is trivial or obvious

Treatment of Trade Secrets and Confidential Information

Employees owe IPC a high duty of loyalty. Employees must keep trade secrets and confidential business information confidential both during and after termination of employment with IPC for whatever reason (provided that in the case of confidential business information it shall be kept confidential for the maximum period permitted by applicable laws).

To assist in your continued compliance with your confidentiality obligations, here are a few tips:

- Protect your computer password; do not share it with anyone outside IPC or anyone within IPC other than as specifically directed by the IT Department.
- Keep sensitive files secure when you are away from your office or desk; lock your office door when you leave at the end of the day.
- Do not share confidential business information (including e-mails) or trade secrets with anyone outside of IPC unless there is a legitimate business reason for them to know the information and, only then, if they relate in any way to trade secrets with the permission of your supervisor or the Legal Department. This restriction includes friends, acquaintances and former IPC employees.
- Be careful (i.e., thorough) when destroying/discarding documents containing confidential business information and/or trade secrets.

- Identify as "Confidential and Proprietary Information of IPC" in boldfaced letters all documents created and/or distributed by you which contain confidential business information or trade secrets.
- Be vigilant in guarding your Blackberry, laptop and other portable devices which contain sensitive IPC information.
- Do not share IPC confidential business information with third parties (including consultants) unless they have signed a standard IPC non-disclosure agreement (available on the intranet site).
- Do not share IPC trade secrets with third parties (including consultants) unless they have signed a standard IPC non-disclosure agreement (available on the intranet site) and you have permission from the Legal Department.
- Do not engage in sensitive business conversations in elevators or other public spaces where third parties may eavesdrop. We are in a narrow, discreet market -- you never know who is listening.

This is not an exhaustive list; we encourage each of you to implement additional protective steps that can be taken within your particular area.

Employees are not authorized to access or use IPC's trade secrets and/or confidential business information for any purpose other than those specifically authorized by IPC. In no circumstances may trade secrets or confidential business information be accessed or used for the employee's own benefit, for competitive purposes or for non-IPC business purposes. Accessing IPC's trade secrets and/or confidential business information with the intent of using them in a manner that is in breach of the employee's duties or obligations owed to IPC is also prohibited.

Employees shall not discuss any matter that constitutes a trade secret with anyone other than an employee of IPC who has a need to know such information without the prior written consent of the IPC General Counsel. An employee shall not discuss any matter that is of a confidential nature with anyone other than an employee of IPC or a third party (where such third party has been specifically authorized by IPC and is under a duty to protection such confidential information) who has a need to know such information. Any discussions that do take place must be appropriate in both their content and location. Employees should never discuss any confidential business information or trade secrets in a public place. Without limiting the scope of the previous sentences confidential business information and trade secrets should never be discussed with a competitor of IPC (including its employees, contractors and agents). Such discussions may cause IPC and the employee personally to have violated applicable Antitrust/Competition laws.

Each employee has a responsibility to take reasonable precautions regarding the security and safekeeping of confidential business information and trade secrets, including but not limited to marking all plans, internal PowerPoint presentations and other confidential materials "confidential" and locking up or otherwise securing such information. Employees are responsible for the security of any passwords or encryption keys they are given or create to protect any IPC confidential information or trade secrets. You should not share or allow others to use such passwords or encryption keys.

Employees shall not disclose or share confidential business information and/or trade secrets through social media such as Facebook, LinkedIn, Twitter etc. Please also refer to IPC's Social Media Policy. Employees should think carefully about the media through which they communicate confidential information and/or trade secrets. Where practicable, avoid sending unprotected electronic versions of confidential business information. Electronic versions of trade secrets must never be sent without appropriate encryption or protection.

Every employee must disclose fully to IPC any inventions, ideas, works of authorship, and other trade secrets that are made, developed, and/or conceived by him or her alone or jointly with others or that arise out of or relate to his or her employment or other relationship with IPC. All such inventions, ideas, works of authorship, copyrights, and other trade secrets are and shall remain the sole property of IPC. Each employee must agree to execute and deliver to IPC such assignments, documents, agreements, or instruments that IPC may require from time to time to evidence its ownership of the results and proceeds of the Employee's services and creations.

Upon termination of employment or at IPC's request, each employee shall promptly return to IPC all memoranda, notes, records, reports, technical manuals, and any other documents (and all copies thereof) in his or her possession, custody, or control relating to IPC's business including IPC trade secrets. IPC may require the employee to certify that they have complied with this obligation.

Further Information/Advice

Please contact the Legal Department with any questions, comments or concerns regarding this Policy or the use of confidential information or trade secrets.

EXHIBIT

4



Go to...

Cloud9 Introduces Gateway Service to Help Firms Connect with More Counterparties and Migrate Away from Turrets

Posted by Steve Kammerer on May 2, 2016 6:17:54 PM

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45



Cloud9 is now introducing Gateway: a service enabling traders to toss their turrets but still stay connected with counterparties, even if they are not yet using Cloud9.

The Cloud9 Gateway service provides system interoperability between existing trader voice circuits and the Cloud9 community by converting traditional TDM T1/E1 to WebRTC protocol. Cloud9 users can seamlessly connect with trading firms not yet established on Cloud9's service and maintain their functionality for both shout-downs and ring downs.

The Gateway Service supports two deployment models: **hosted** or **on-premises**. Both configurations offer various features and benefits, although Cloud9 recommends reviewing your technical and support needs to determine which option is best for your firm.

Advantages of the Cloud9 Gateway service include:

- Ability to expand your trading network and connect to counterparties on and off Cloud9.
- Rapid migration from trading turrets onto the Cloud9 service
- Improved disaster recovery capabilities by giving firms the ability to maintain connectivity during disaster scenarios.

Hosted Service

The hosted gateway option allows Cloud9 users to access traditional trader voice circuits by connecting their circuits to Cloud9 at a hosted facility. Pricing for this service is on a per month basis.

Benefits of a Hosted Service Include:

- Best support model for firms looking to relocate offices while transitioning to Cloud9.
- Circuits can be accessed by Cloud9 users within the firm from any location once they are connected to carriers.
- Ease of management by deploying inside a controlled data center environment vs on-premise.
- Loss of Internet or catastrophic event has no effect on operations due to redundancy within an off-site facility.
- Upgrades, patches and new features are included.

On-Premise Service

The on-premise service option is for customers that prefer not to move their existing trader voice circuits to a hosted data center. It also requires that a suitable IT environment be established for installing the Cloud9 gateway. This service option also gives customers a choice to purchase the service through monthly recurring fees, or as a single one-time charge.

Benefits for The On-Premise Service Include:

- No requirement to coordinate circuit relocation with telecom carriers - lines can be managed on site.
- Available for Cloud9 customers regardless of location.
- Upgrades, patches and new features are included.

To learn more about Cloud9, check out this quick introduction.

Topics: Cloud9 Product, Cloud9 News

First Name*

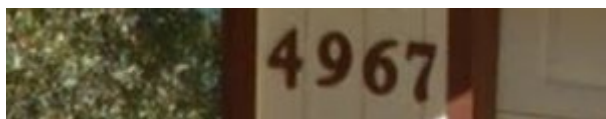
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It's Time for Cloud9

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Cloud communication services for businesses and business communities.

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EXHIBIT

5

(12) **United States Patent**
Greene et al.

(10) **Patent No.: US 6,212,177 B1**
 (45) **Date of Patent: Apr. 3, 2001**

(54) **REMOTELY ACCESSIBLE KEY TELEPHONE SYSTEM**

(75) Inventors: **Steven Greene**, Larchmont, NY (US);
Richard C. Bozzuto, Jr., Westport, CT (US)

(73) Assignee: **IPC Information Systems, Inc.**, New York, NY (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **08/657,396**

(22) Filed: **Jun. 3, 1996**

(51) Int. Cl.⁷ **H04L 12/64**

(52) U.S. Cl. **370/352; 370/463; 379/156**

(58) Field of Search 379/156, 90.01, 379/93.01, 93.02, 93.03, 93.04, 93.05, 93.06, 93.07, 93.09, 93.14, 93.17, 157, 201, 210, 211, 212, 164, 165, 162, 265; 370/352, 353, 354, 355, 356, 400, 401, 410, 422, 420, 463, 259, 260, 270, 381, 388; 375/260

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* cited by examiner

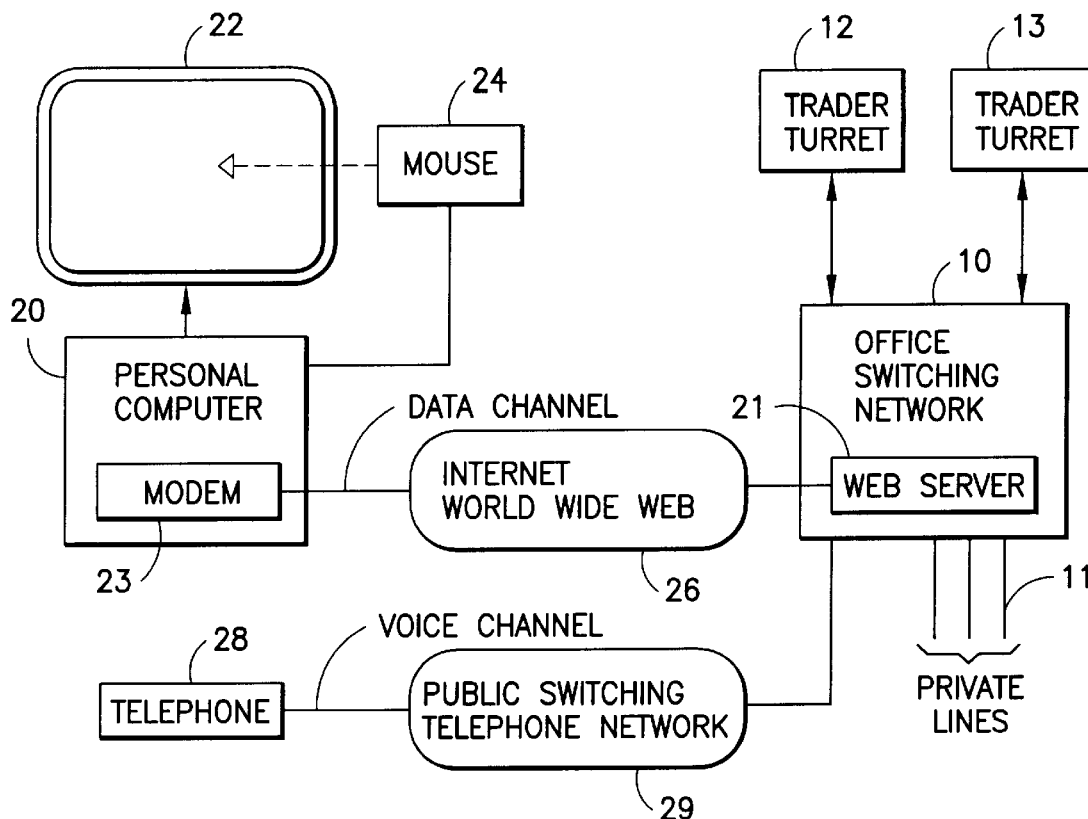
Primary Examiner—Huy D. Vu

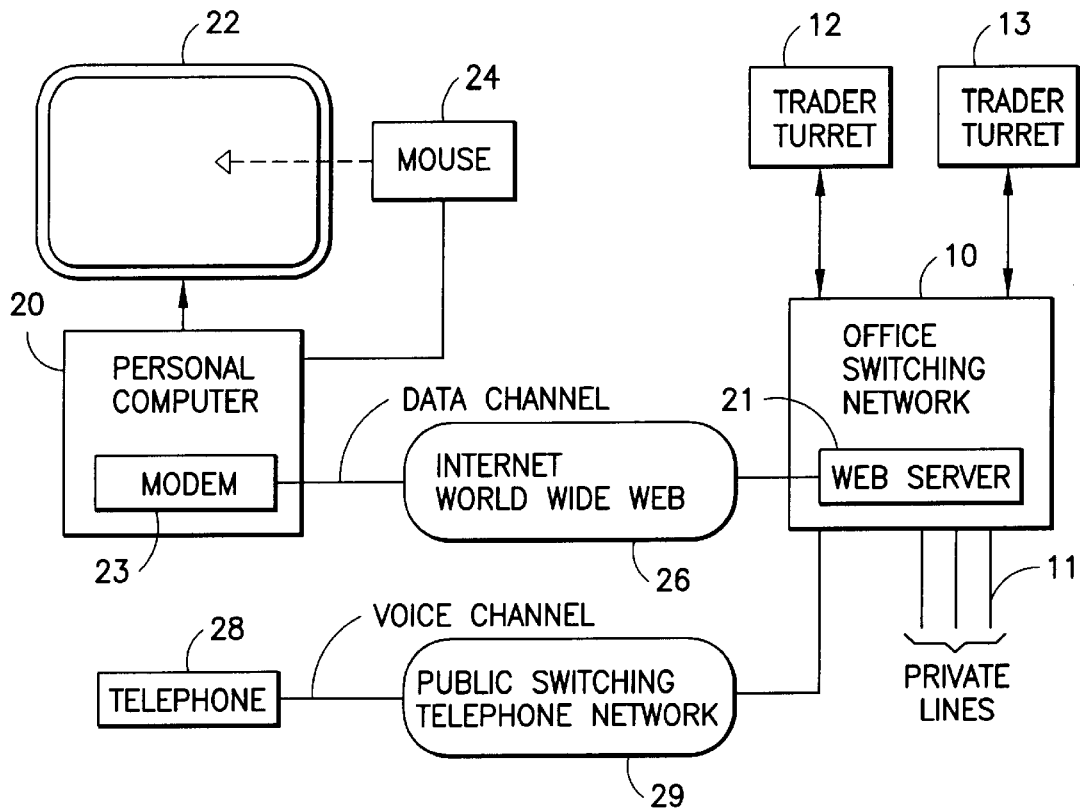
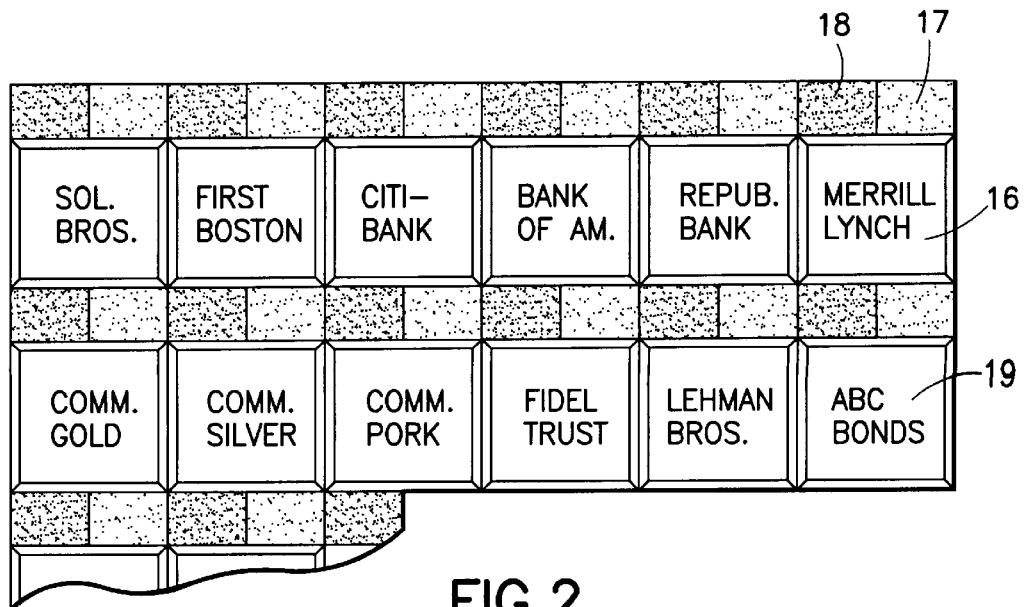
(74) Attorney, Agent, or Firm—Morgan & Finnegan, LLP

(57) **ABSTRACT**

A remote access system for a trader turret telephone switching network. A line status display is created at the remote site using the Internet as a data channel. A line command can be entered remotely using a "mouse" (or other graphical interface) and communicated back to the switching network via the Internet. A voice channel can then be established to the remote site via the public telephone switching network or via the Internet.

11 Claims, 1 Drawing Sheet



U.S. Patent**Apr. 3, 2001****US 6,212,177 B1****FIG. 1****FIG. 2**

US 6,212,177 B1

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REMOTELY ACCESSIBLE KEY TELEPHONE SYSTEM

BACKGROUND THE INVENTION

A line telephone stations, often referred to as “trader turrets”, are widely used in financial trading networks such as between banks, brokerage houses, and other types of financial institutions. Telephones of this type provide access to a large number of telephone lines, typically a hundred or more. A line is selected by depressing a single key. A trading room can include many telephone key stations so that many transactions can be completed simultaneously.

Each key telephone station in a trading room has voice channel access to other stations in the trading room and to a large number of outside lines of different types (public, private, four wire etc.) Normally each outside line is available at several stations so that any one of several traders can pickup an incoming call. A status indication is provided for each voice channel at each station where the line is available to indicate ringing, busy, hold, idle, conference, etc. The status line indications are supplied through a separate data channel for all the lines available at a station. This status information is invaluable to the operator since it provides an overall picture of the trading activity. A major obstacle to providing remote turret interconnections to a trading room, however, is the difficulty in providing the necessary data channel information of line status to the remote location.

SUMMARY OF THE INVENTION

The system according to the invention provides both a voice channel and a data channel to a remote trader turret via public networks. The voice channel is preferably established using the public telephone network. The data channel is established via the Internet. The World Wide Web (WWW) is used to supply graphical information via the Internet to provide a line status display at the remote site. The channels on these two public networks are coordinated to provide remote access to the trading room switching network. With this arrangement a trader can engage in trading activities from a home office or while traveling.

Alternatively, the Internet can be used to provide a voice channel so that the Internet provides both the data channel and the voice channel.

To set up the system, the remote operator contacts the office web site by giving the necessary passwords and by then identifying the remote site for the Internet connection and the telephone number of the remote location. The office equipment supplies a screen display via the Internet giving the status of all the lines accessible to the particular trader. When the remote operator wishes to take an incoming call shown to be ringing on the remote screen, the remote operator uses a mouse to “click” on the ringing screen indication. The office system connects to the calling party and then dials the remote trader via the public telephone system to connect the parties. A similar procedure is used for placing a call from the remote location. The remote operator “clicks” on the display indication for the desired party. The office system calls the remote party on the public telephone system and then connects to the party being called.

The remote operator can use a personal computer with a high speed modem for connection to the Internet plus an ordinary telephone connection. For mobility, a laptop type computer could be used and the modem could be connected via a cellular telephone network. The remote access according to this invention does not match the speed or flexibility of the trader turret system at the office, but does provide the

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much needed access to the system when working at home or while traveling.

BRIEF DESCRIPTION OF THE DRAWINGS

A preferred embodiment of the invention is illustrated in the drawings which are part of the specification and wherein:

FIG. 1 is a block diagram illustrating the system according to the invention, and

FIG. 2 is a line status display which may appear on the trader turret or the video display.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

FIG. 1 illustrates a typical office switching network 10 which includes the back room switching gear such as in the MX system sold by IPC Information Systems Inc., assignee of this application. Trader turrets (key telephones) 12 and 13 are coupled to the switching network which establishes a voice path to selected lines 11. In most cases lines 11 are private lines connecting to other brokers and financial traders. Line cards within the switching network 10 maintain the status of each of the lines. The status information is distributed to each of the trader turrets where the information is displayed for use by the trader. A typical trading room may have hundreds of line connections and each trader turret has access to 30 or more of these lines.

A display at a trader turret may appear as generally shown in FIG. 2. Each line key is associated with a trading partner. For example, line key 16 may be identified with “Merrill Lynch”, line key 19 may be identified with “ABC Bonds”, etc. A pair of indicating lights is associated with each of the line keys. Indicator light 18 may be green and indicate the line is in use by a steady on condition, or the line is ringing by a rapid flashing condition, or the line is on hold by a slow flashing. The other indicating light 17 can be amber in color and when lit indicates that the associated line is connected to the station where the amber light appears. If lights 17 and 18 are both off, then the associated line is not in use and may be seized by any trader turret having access to the line.

A personal computer 20 is used to create a remote line status display on the computer screen 22. The screen display can simulate the line status display on the trader turret and appear on the screen like the display shown in FIG. 2. The computer preferably includes a “mouse” 24 which can “click” on the line keys of the display. A data channel is established between office switching network 10 and the personal computer to communicate the line status information for creating the line status display on the screen. The publicly available Internet World Wide Web (WWW) 26 can be used as a data channel between a web server 21 in the office switching network and a modem 23 in the personal computer. Alternatively, in place of a modem, a network connection, such as an ISDN connection, can be used. The Internet can also be used to provide password access and can be used to supply a telephone number for reaching the trader. A voice channel can be completed from the office switching network to a telephone 28 via the public switching telephone network 29. Alternatively, the Internet can be used to establish the voice channel.

The personal computer can be a home computer with sufficient capacity to create a high resolution color display from data received on the data channel via the Internet. Alternatively the computer can be a lap-top type computer that can be coupled to the office switching network through a cellular telephone network. The modem is preferably a

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high speed modem to reduce the time required to update the screen display. A network connection can be used in place of a modem for the data channel.

In operation the remote trader first contacts the web server via the Internet. After supplying the correct password, the data channel is established between the office switching network and the personal computer. Line status information is supplied to the remote computer and a display similar to that in FIG. 2 is created on the screen. The line status is periodically updated.

To answer a ringing call indicated by a flashing indication, the trader operator clicks on the associated key displayed on the screen. The office switching network calls the associated telephone 28 via the public telephone system 29 and connects the telephone to the indicated calling party.

To seize an idle line, the trader similarly clicks on the desired line key. The office switch calls the associated telephone via public network 29 and then connects the telephone to the called party.

To pick up a party on hold, the remote trader clicks on the line key associated with the party and the office switch then connects the holding party to the associated remote telephone. A similar procedure is used to add-on to a conference call.

Although only one illustrative embodiment has been described in detail, it should be obvious that there are many variations and alternatives within the scope of this invention. The invention is defined in the appended claims.

What is claimed is:

1. A remote access system for connecting a remote station to an office network of the type including a plurality of private line key telephones, comprising:

- a) an office switching network for interconnecting private telephone line communications;
- b) a plurality of key telephones coupled to said office switching network, each of said telephones
 - 1) providing access to a plurality of private telephone lines, and
 - 2) providing line status information for the telephone lines accessible from said key telephone;
- c) a remote computer including means for establishing a data channel communication between said office switching network and said remote computer via public network;
- d) means in said office switching network and said remote computer for creating a line status display at a remote location indicating the status of lines accessible in said office switching network;
- e) means at said remote computer for selecting accessible lines indicated in said remote line status display and communicating said selection to said office network; and

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f) means in said office network for connecting a selected line to a telephone at said remote location site according to said selection via public network and independent of said data channel communication.

2. The remote access system according to claim 1 wherein said data channel communication between said office switching network and said remote computer is via a public access data channel.

3. The remote access system according to claim 2 wherein said data channel communication is via the Internet.

4. The remote access system according to claim 1 wherein said line status display is on a video screen controlled by said remote computer.

5. The remote access system according to claim 4 wherein said means for selecting accessible lines at said remote computer includes a user interface for selecting portions of said video screen line status display for changing line status.

6. The remote access system according to claim 1 wherein said means for connecting a selected line establishes a voice channel via the public telephone switching network.

7. The remote access system according to claim 1 wherein said means for connecting a selected line establishes a voice channel via the Internet.

8. A method of establishing remote access to a private line office network including a plurality of key telephone stations with line status information being displayed at said telephone stations, including the steps of:

- a) establishing a data channel between said private line office network and a computer at a remote site via public network;
- b) establishing a remote line status display at said remote site based on data received via said data channel;
- c) selecting an accessible line from said remote line status display at said remote site;
- d) communicating said selection from said remote site to said private line office network via said data channel;
- e) establishing a voice channel independent of said data channel to said remote site via public network according to said selection from said remote site.

9. A method of establishing remote access to an office network according to claim 8 wherein said data channel is established via Internet.

10. A method of establishing remote access to an office network according to claim 8 wherein said voice channel is established via the public telephone switching network.

11. A method of establishing remote access to an office network according to claim 8 wherein said voice channel is established via the Internet.

* * * * *

EXHIBIT

6



C9 Trader Service User Guide

JUNE 2017

C9 TRADER USER GUIDE

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C9 TRADER USER GUIDE

1. Launching the C9 Trader

Installation of the C9 Trader application on your computer places an icon on your desktop so that you can access Cloud9.



Double-click on the C9 Trader icon to start the application.

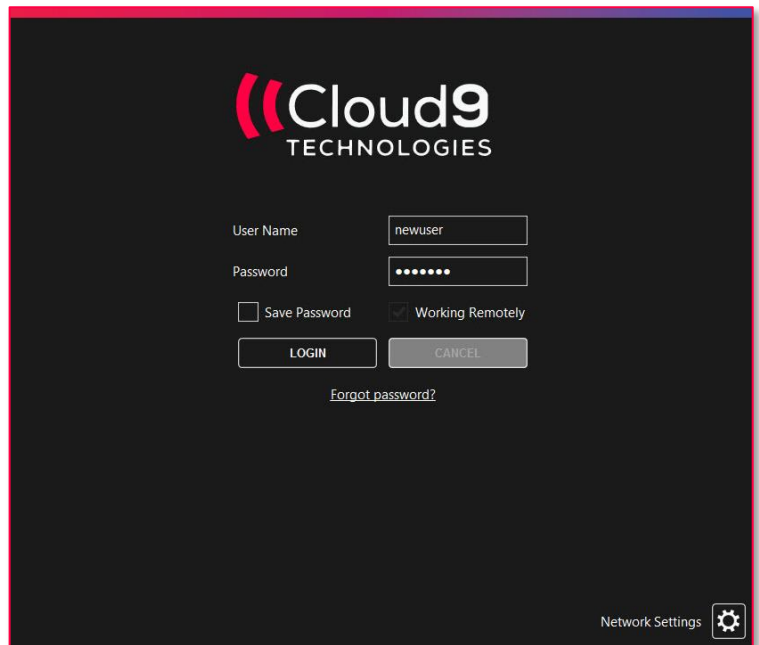
2. Logging in to Cloud9

To begin using Cloud9, log in with your unique username and password. The first time you log in, enter the username and password provided in the welcome email sent by Cloud9.

The password you received is *temporary*, and you will need to change it to a personalized password of your choice.

There are also two options you can select when logging in:

- **Save Password:** If selected, your credentials will autofill when you log in.
- **Working Remotely:** Select if you are working from a location outside of your office or desk. This disables the neighbor feature and will allow you to communicate from outside of the office with the coworkers programmed to your neighbor list.



C9 Trader Login Screen

Once you're successfully logged into the C9 Trader, you will see the following window, with buttons representing connections to your counterparties displayed.



The Control Panel, to the left of your main screen, contains buttons that enable you to access setting and configuration capabilities for your C9 Trader.

When logged into Cloud9, the home screen displays by default. Configuring buttons and various settings will open new windows and menus. Clicking the Home button will bring users back to the main screen of the application.

Selecting the Community button opens the Cloud9 Community window, which enables users to provision connections to firms and organize their buttons. **Section 4.0** of this user guide provides more detail about making connections using the Cloud9 Community and the other features available through the Community window.

C9 TRADER USER GUIDE

3.1.3 Microphone Control Button

This button allows enables users to toggle to an established microphone device for use during current speaker call. When the microphone is in use, a volume meter will display, showing the level of sound being transmitted.

3.1.4 Handset Control Button

This button enables the user to toggle to an established handset device for use during a call that is being broadcast through a speaker. When the handset is in use, a volume meter will display, showing the level of sound transmitted through the device.

3.1.5 Privacy Control Button

This button will only be available if a user has the privacy feature enabled for their account by their administrator. This button toggles privacy settings on and off. (See **Section 6.2** for more details)

3.1.6 Settings Button

This button opens the Settings menu on the right side of the home window. The Settings menu (see **Section 3.5**) allows a user to set their preferences in your C9 Trader.

3.1.7 Call History Control Button

This button displays a user's Call History in the bottom half of the application, and shows all of the call events that have occurred for the user since they have logged into the service.

3.1.8 Click to Call Button

The Click to Call button opens a separate window where users can conduct one-on-one calls, using dialing capabilities, to any desk phone or mobile phone. (See **Section 5.1** for more details)

3.1.9 Master Volume

The user can control the volume of the C9 Trader application using the slider on the Master Volume button. This is always relative to the master volume of the C9 Trader when the user logs in and will not affect the volume of any other applications. This icon also has a receive level indicator that lights up when a user receives a call.

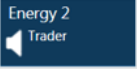

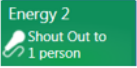
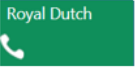
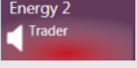
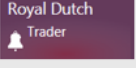
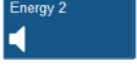
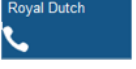
3.1.10 Call Release Control Button

The Call Release button enables a user to end an active call. By clicking this button, a user can hang up on a call.

C9 TRADER USER GUIDE

3.2 Button Presence

Each button displayed on your main screen represents a counterparty. You can initiate a call to a counterparty via a shoutdown or a ringdown. Each button provides the user with presence status about their counterparty and whether a current voice call is in progress.

C9 Button Status Indications			
SPEAKER BUTTON	SESSION STATUS	SESSION STATUS	RING DOWN BUTTON
	Idle	Idle	
	Outgoing shout	Outgoing call	
	Incoming shout	Incoming ring	
	Offline	Offline	

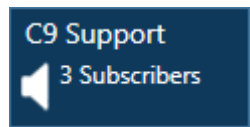
C9 Button types and status indications

3.2.1 Button Subscribers

The C9 Trader makes it easy to see the subscribers associated with each of your buttons.



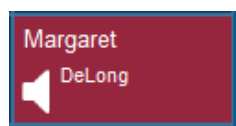
When a button has up to two active subscribers, their names will display on the button.



When a button has three or more active subscribers, the button will display the number of users who are connected.



To view the full list of people who are connected to a button, you can right click on that particular button and it will open up a list that includes all currently connected parties by both first and last name



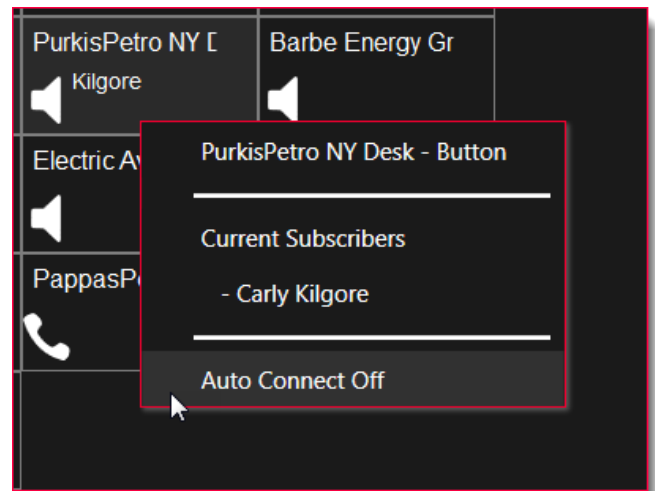
When you are speaking, your name will be displayed on the button so everyone else connected can see who is speaking. The speaker's last name is prioritized over the subscriber list. You can still right click on the button to view the entire subscriber list.

C9 TRADER USER GUIDE

3.2.2 Auto Connect

Buttons can be set to Auto Connect which establishes a constant open audio path as long as this feature is enabled. Auto Connect is particularly useful if your firm has two office locations and want to listen to the activity occurring in the other office.

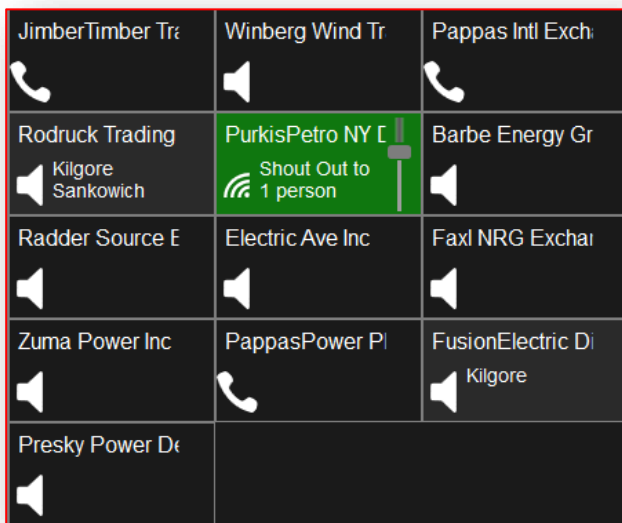
To enable Auto Connect, right click on the button of the counterparty to establish a connection and select the Auto Connect Off option. This will checkmark Auto Connect into the "on" position.



Enable Auto Connect

An open audio path is now enabled, and will flash green on your end and red on the far-end.

To disable Auto Connect, right click on the button and deselect the Auto Connect option. Select Ok to confirm.



Open Audio Path

C9 TRADER USER GUIDE

3.3 Button Volume

Instead of adjusting the master volume on your computer, speakers, or by using the Master Volume button, you have the ability to adjust the volume of individual buttons. This gives you more control over which of your counterparties you want to hear at a given time.

When hovering your mouse over any of your buttons (active or inactive) you will see a scroll bar appear on the right of the button. This indicates the volume setting for that connection. You can adjust the volume by either using the scroll-wheel to increase/decrease the volume or by clicking and dragging the slider.



When you mute your counterparty by reducing their volume below an audible level, a red indicator will display on the button.

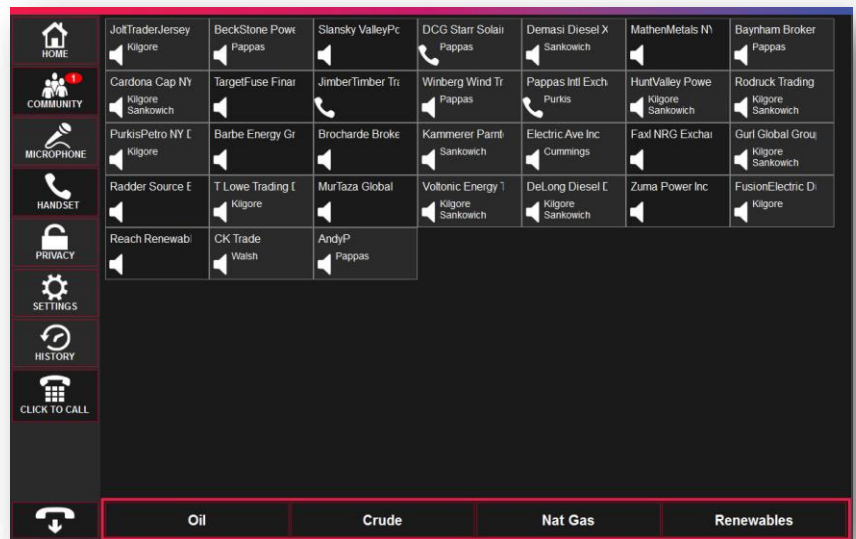
Note: If using an 8 or 16 button board, button your volume may also be adjusted via the volume knobs on the board.

3.4 Group Broadcast Buttons

In addition to shouting to a single counterparty, Group Broadcast buttons, located at the bottom of the C9 Trader, enable you to shoutdown to multiple connections at once.

When a Group Broadcast button is selected, it will open your microphone to all of the mapped buttons.

If your counterparty responds, the conversation is still one to one. The other counterparties in the group cannot hear the conversation.



Group Broadcast Buttons

C9 TRADER USER GUIDE

- **Drop Functionality:** When shouting down to a group of assigned counterparties, you can disconnect from a specific counterparty by clicking on the button assigned to that counterparty. This will disconnect that line without disconnecting all the counterparties associated with the group.

This function is important in a scenario where you are shouting out to a group of individuals and would like to drop a participant from the activity in progress.

- **Add Functionality:** When shouting down to a group of assigned counterparties, you can also add a new counterparty to the group by clicking on the button corresponding to that counterparty. The new counterparty is added to the group broadcast for the session that broadcast is active. As soon as the group broadcast has been unselected, the added counterparty will no longer be part of any future conversations using that group broadcast button.
- **Creating a Dynamic Group:** Users can select an empty group broadcast button and dynamically add up to ten counterparties to create an impromptu group broadcast. Once the broadcast has ended, that group broadcast button will reset.

Note: Turning on Multi-Press (Section 3.5.1) will disable the ability to use an empty group broadcast to create a dynamic group,

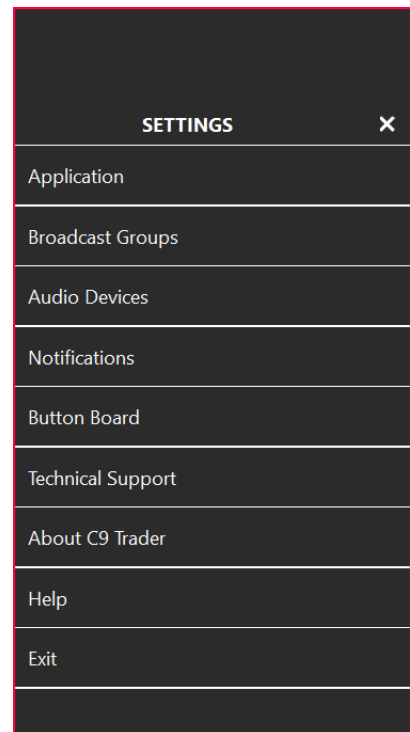
Details on the setup of a Group Broadcast button are located in **Section 3.5.2**.

3.5 Settings Menu

Many of the features of the C9 Trader can be controlled by the Settings menu. Clicking on the Settings button within the control panel will display the Settings menu on the right side of the application.

There are eight options to select within the settings menu:

- Application
- Broadcast Groups
- Audio Devices
- Notifications
- Button Board
- Technical Support
- About C9
- Help
- Exit



C9 Trader Settings

C9 TRADER USER GUIDE

Selecting any of these menu items will expand the display, and allow you to access and adjust your options.

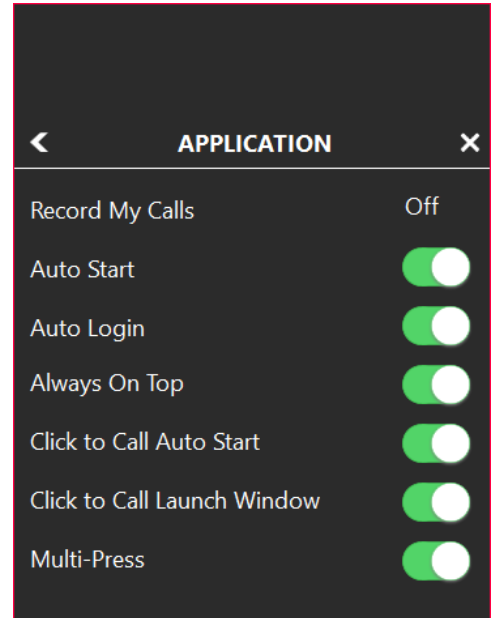
3.5.1 Application Settings

The Application Settings tab enables you to set some of your personal preferences for your C9 Trader.

The **Record My Calls** setting displays whether or not your user account has call recording turned on or off. This option cannot be changed within the application itself. Please contact your system administrator if you need to have your call recording option adjusted.

Auto Start determines whether the C9 Trader will start automatically upon turning on your computer or device. Auto Login will enable you to bypass the login window and automatically login using your personal credentials.

Note: In order for Auto Login to work, you must have the save password option selected on the login screen.



Application Settings

The **Always On Top** setting enables you to control whether the C9 Trader application window always appears on top of other applications or if it can be placed behind other application windows running on your computer.

Click to Call Auto Start determines whether or not Click to Call will register automatically when users log in to the C9 Trader. This enables users to receive incoming calls even if the Click to Call window has not been launched. Please note, Auto Start must be switched to the on position or inbound calls will not be received.

The **Click to Call Launch Window** provides the option for the Click to Call window to automatically launch when the user logs in to their C9 Trader. In the scenario that the Click to Call window is minimized and the user receives and incoming call, a notification will display, and the user must select the notification to answer the call. Please note, Auto Start must be switched to the on position.

Enabling **Multi-Press** allows a Cloud9 user to randomly select and unselect shout down connections to create a dynamic group broadcast. In the Application Settings menu, users can toggle between the current single-press (off) and new multi-press (on) functionality.

Note: Turning multi-press on will disable the ability to use an empty group broadcast to create a dynamic group.

C9 TRADER USER GUIDE

3.5.2 Broadcast Groups

Broadcast Groups enables you to set up and name your Group Buttons, used to shout to multiple counterparties at once.

Users can create up to four different groups. The first drop down menu enables you to select which of the four groups you want to edit.

You also have the ability to rename is group within the textbox. Please note that group names can only consist of alpha-numeric characters.

Up to ten different buttons can be assigned to a group. Those buttons are selected via the drop down menus below the group button name. Only connections that are currently on your user interface will be selectable.

Groups are automatically saved once each selection is made.

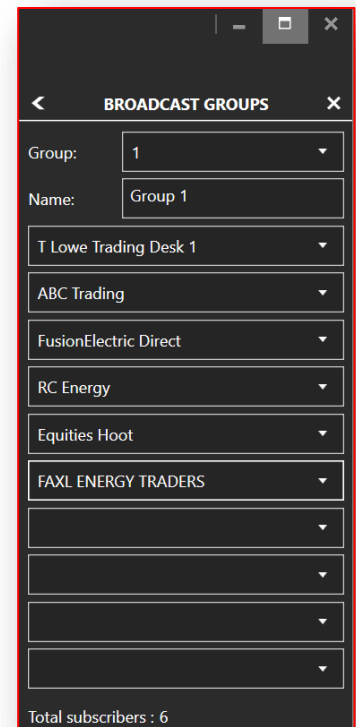
Note: Ringdown connections cannot be assigned to a group.

3.5.3 Audio Devices

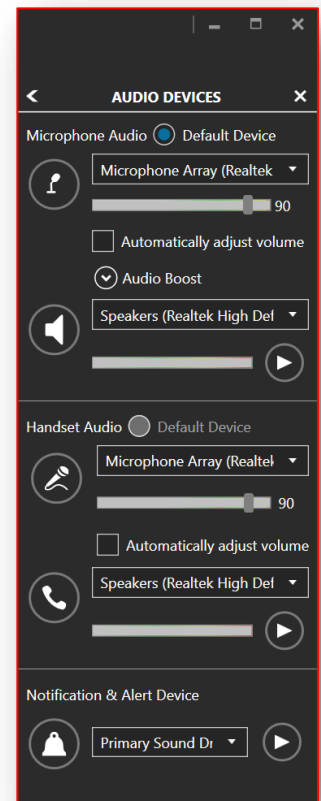
Usage of the application requires a microphone and speaker. The Audio Devices section of the settings menu will enable to you select those devices and configure them so that your voice is being transmitted clearly. The section is broken down into three segments: Microphone Audio, Handset Audio and Notification & Alert Devices.

The **Microphone Audio** segment controls the configuration for your default microphone and speakers being used with the application. You can select your default microphone and speaker devices via their respective drop down menus. You can adjust the volume of your microphone using the slider below the microphone drop down to suit your environment and ensure no background noise is picked up. Additional audio boost can also be added to amplify your voice once it's picked up by the microphone.

The **Handset Audio** settings enable you to configure a handset if you choose to use one. Similar to the microphone audio, you will have to select both the microphone and speaker that are associated with the handset. Again, the volume can be adjusted to fit the surrounding environment.



Broadcast Groups Settings



Audio Devices

C9 TRADER USER GUIDE

In the Microphone and Handset sections you also have the option to select a default device for responding to shoutdown calls. All incoming audio will be received on the speaker, and, if you would prefer to respond with a handset on these calls, you can change the default setting using the Default Device radio button.

If you do not make a selection, your microphone will automatically be the default device. You can also still toggle between your microphone and handset for individual calls at any time.

In the **Notification & Alert Device** segment, you can select the device that will transmit a ring when someone is signaling on a ringdown connection.

Important Note: If a device is in use on the C9 Trader, then it *will not* be available for selection or use on Click to Call. The device will be greyed out in the drop down.

3.5.4 Notifications

Notification options allow you to adjust the type of ring and notifications you receive when using the application.

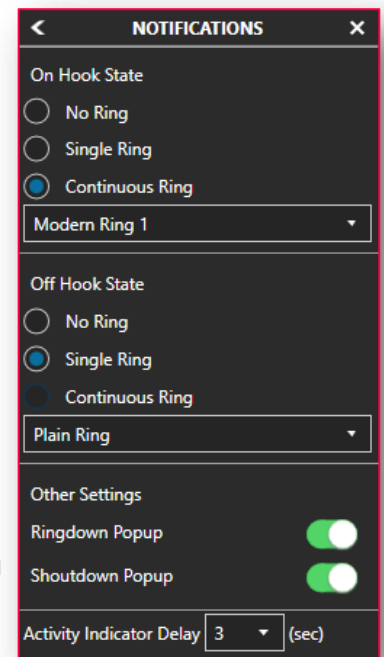
On Hook State refers to when your application is in an idle state and you're not engaged in conversation with counterparties. The ring options determine the duration of the ring when a counterparty is connecting to you via a ringdown button. You have the option to turn the ring notification off, be alerted with only a single ring, or have the application ring continuously until you either answer or the counterparty hangs up. The default setting is continuous ring.

Off Hook State refers to when you're actively engaged with a counterparty. Similar to the on hook state, this option will determine the duration of the ringer when a counterparty attempts to reach you via a ringdown button. The default for this option is set to single ring.

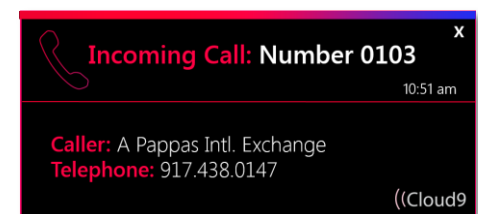
Both on hook and off hook states have various ring tones that can be selected from the dropdown menus in each section.

Below the ring options for the application are settings to adjust the popup notifications that appear on your desktop when the application window is closed and running in the background:

- **Ringdown Pop-up:** This option allows you to receive pop up toast messages when the C9 Trader application window is closed and call activity occurs on ringdown buttons
- **Shoutdown Pop-up:** This option allows you to receive pop up toast messages when the C9 Trader application window is closed and call activity occurs on speaker buttons



Notifications



Pop-up Notification

C9 TRADER USER GUIDE

The **Activity Indicator Delay** setting is located at the bottom of the menu. This setting determines how long a button will flash on your interface once a call has ended if it goes unanswered. The default is set to three seconds but you can select a range from 0 - 60 seconds.

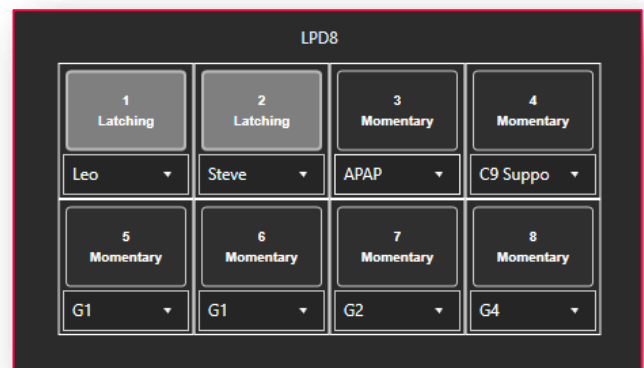
3.5.5 Button Board

Instead of using the mouse to engage your buttons, you can opt to use a button board. There are many benefits to using the button board, the main one being speed and efficiency. Button boards connect to your computer via USB and come in three sizes – 8, 16, or 24 buttons.

The button board acts independently of the application when it is first plugged in. You need to map the buttons you want to use to the board. This is done by selecting Button Board within the Settings menu. The board size will automatically be detected by the Cloud9 application, and the Button Board Configuration window mirroring your device will display on the bottom of your C9 Trader Screen.

For each button displayed in the window, click the drop down menu and select the connection you would like to assign to that button.

On the 8 and 16 button board, in addition to assigning individual button connections, you can select group buttons, assign a call release button - which enables you to press a button to end a call, or assign a handset toggle button - which enables you to press a button to switch to a handset.



Button Board Configuration

On the 24 button board, you can assign group broadcasts to buttons as well as designate a Float button on your board. A Float button holds space on your button board for incoming calls from other pages on the board, so you can access them easily.

The 24 Button Board also features fixed function keys that support handset toggle, call release, as well as arrows that allow for navigation on the board.

On all button boards, buttons can be set up to be either momentary or latching:

- **Momentary (default):** Push to talk, the microphone is open while you hold the button down.
- **Latching:** One push will open the microphone (no holding necessary) and another push will close it. Ringdowns, which can be assigned on the 24 button board, can *only* be set as latching.

C9 TRADER USER GUIDE

3.5.6 Technical Support

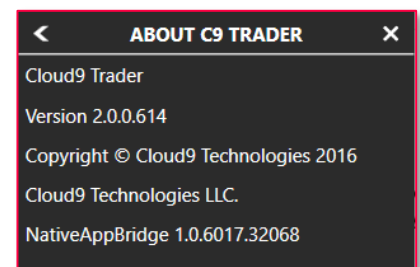
Cloud9's customer service and support team is available 24/7 to help you with any questions you may have about Cloud9. Clicking on the technical support option within the settings menu will open a new email addressed to the Cloud9 support staff at helpdesk@c9tec.com. The email will be opened using the default program set by your Windows operating system.

The email itself will have the address and subject already filled out for you. All you need to do is fill out the body of the email, providing as much detail as possible about the problem you are having.

All emails sent to Cloud9's support staff are answered within 24 hours, with many issues finding resolution in under five minutes.

3.5.7 About C9 Trader

Clicking About C9 Trader displays information about the current version of software you are running. Some of the information displayed here might be useful in troubleshooting any service-related issues you may be having.



About C9 Trader

3.5.8 Help

Clicking Help redirects users to the Cloud9 Support Knowledge Base, which contains helpful video tutorials, step by step guides, and articles about every feature of the C9 Trader and Portal.

3.5.9 Exit

Clicking Exit will fully close the application and log you out of the service. Before exiting, a confirmation displays to ensure that this is a deliberate action.

Note: Clicking the X icon in the top right of the application window will not close the application. Doing this only minimizes the interface while the app runs in the background off-screen.

C9 TRADER USER GUIDE

4. The Cloud9 Community

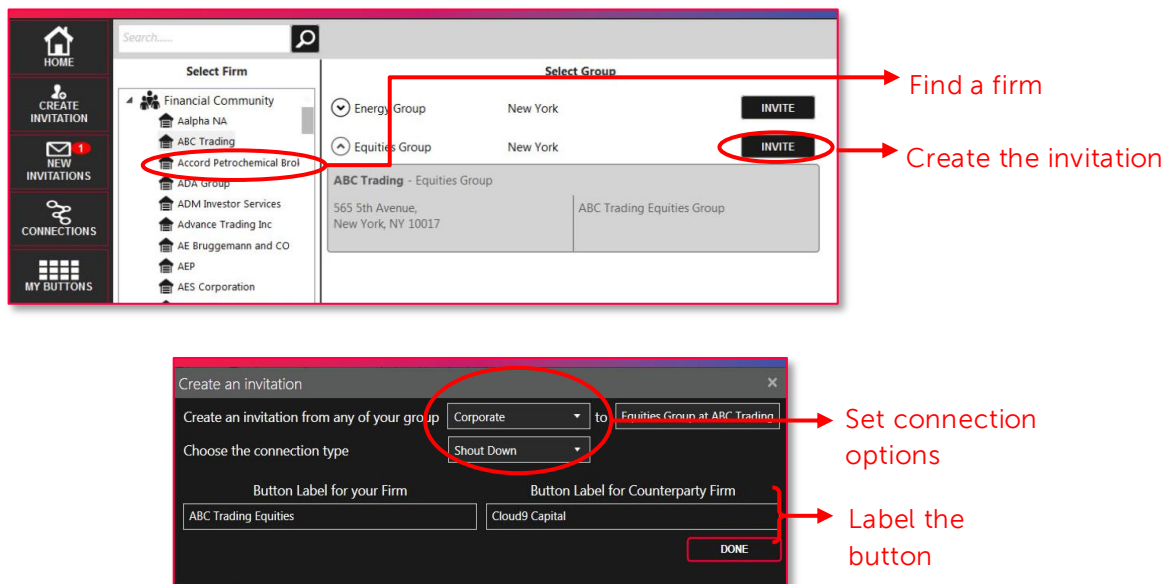
The Cloud9 Community is the main feature of the C9 Trader application. Access to the Cloud9 Community allows you to connect with other firms instantly. From the Community window you can request connections to other participating firms and instantly provision new buttons, accept requests from other firms, and organize your C9 Trader Buttons.

There are four main tabs:

- Create Invitation
- New Invitations
- Connections
- My Buttons

4.1 Create Invitations

The first tab in the community display allows you to search for and connect with available firms and trading groups. You can scroll through, or use the search function to find listed firms in the Community. When you find the firm you are looking for, click the Invite button to create an invitation. Choose what kind of connection will be established, shoutdown or ringdown, and what the button label will be for your firm as well as the counterparty's firm. Click done to send the invite to the counterparty trading group.

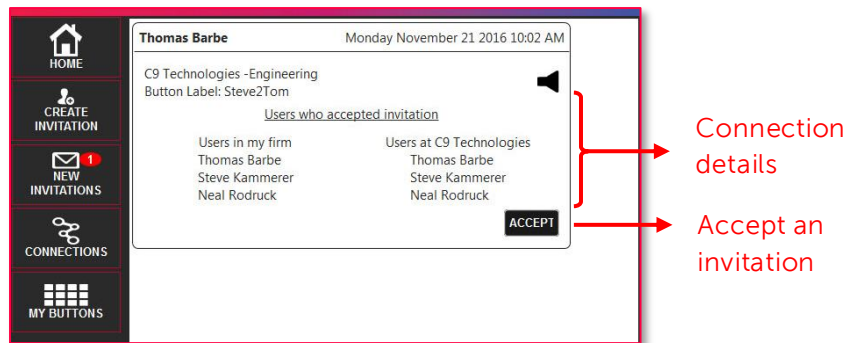


Creating A Connection

C9 TRADER USER GUIDE

4.2 New Invitations

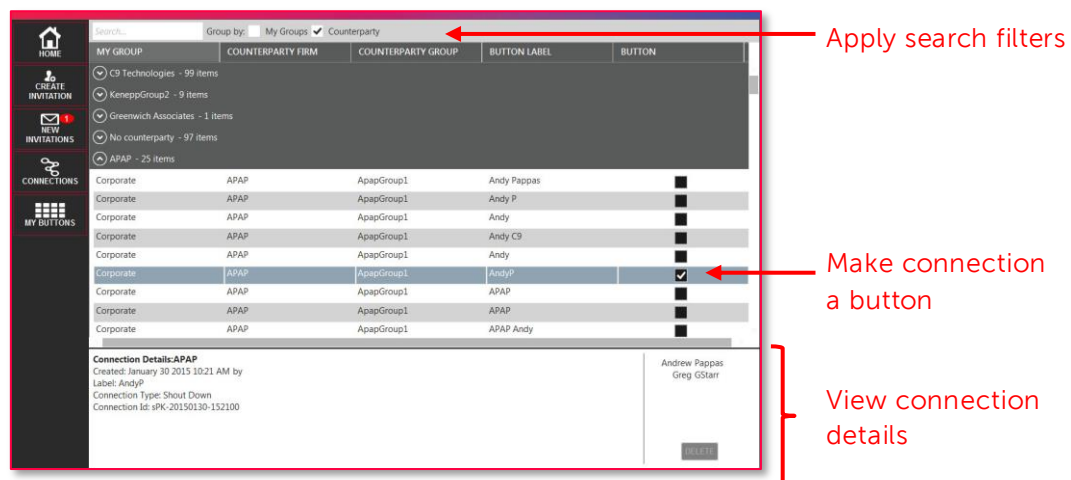
The New Invitations tab displays all new connection requests that have been created within the last 24 hours. These connections can be accepted and added as an active button on your interface. If not accepted after 24 hours, the connection will no longer be listed in this section of the community display. Instead, they will be moved to the connections tab.



Accepting An Invitation

4.3 My Connections

The third tab displayed on the Community Window lists all of the connections that are available for the user to convert into active buttons. An active button can be a shoutdown or ringdown connection and can be used for internal communications within the firm, or used to communicate with traders in external firms.



Adding Connections

C9 TRADER USER GUIDE

4.4 My Buttons

The last tab in the community window enables you to manage all of your contact buttons. On this tab you can:

- **Reorder Button Layout:** Click and drag a button to change its location on your C9 Trader.
- **Relabel Buttons:** Type the new name in the label field at the bottom of the screen.
- **Delete Buttons:** Click the trashcan icon on any button.
- **Get Detailed Subscriber Information for Each Button:** Select a button, and information including the name of the button, button type, and users that share the connection will appear at the bottom of the screen.
- **Set Positional Audio:** C9 Trader users can assign individual button audio to be transmitted from the left, center, or right speakers. To enable positional audio, your administrator will need to contact the Cloud9 Helpdesk.

To assign a button to a certain speaker, select the button and use the Positional Audio dropdown in the button details section to select which speaker the audio will come through for that button – left, center, or right.

By default, all your buttons will be assigned to transmit audio through your left, center, and right speakers.

Move, Rename and Delete My Buttons

JoltTraderJersey G	BeckStone Power	Slansky ValleyPow	DCG Starr Solair	Demasi Diesel Xcl	MathenMetals NY	Baynham Brokers
Cardona Cap NY L	TargetFuse Financ	JimberTimber Tra	Winberg Wind Tra	Pappas Intl Exch	HuntValley Power	Rodruck Trading
PurkisPetro NY De	Barbe Energy Grp	Brocharde Broken	Kammerer Parnter	Electric Ave Inc	Faxl NRG Exchang	Gurl Global Group
Radder Source En	T Lowe Trading D	MurTaza Global	Voltonic Energy T	DeLong Diesel De	Zuma Power Inc	FusionElectric Dir
Reach Renewable	CK Trade	AndyP				

Button Users
Rachel Holmes
Carly Kilgore
Laura Sankowich

Details
Multiparty Connection for C9 Technologies
Type : Shout Down
Connection ID: sPK-20160711-172339

Managing Buttons

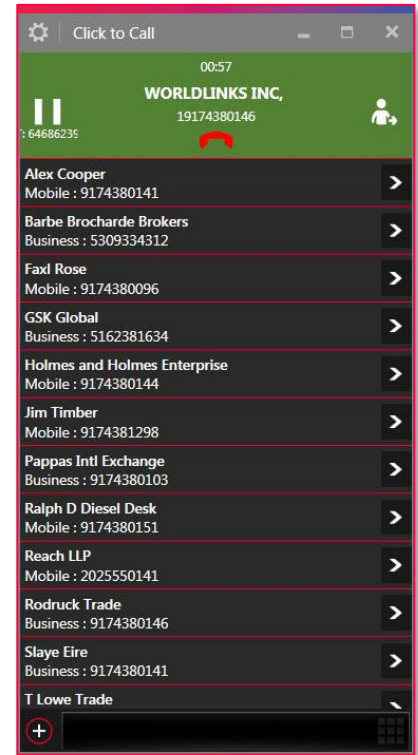
C9 TRADER USER GUIDE

5. Click to Call

To conduct calls to any desk or mobile phone from the C9 Trader, select the Click to Call button. This will open a separate window where you can conduct calls and access your contact directory, which is integrated directly with Microsoft Outlook.

There are a number of key features:

- **Basic Calls:** Type a phone number into the dial pad, accessed on the lower right of your Click to Call screen, to talk to any counterparty in seconds. You can also press any name in the directory to call or type any phone number or name in the Smart Search box at the bottom of the screen.
- **Call Hold and Release:** When a call is in progress, you can hold calls by pressing the pause button in the top left section of your Click to Call window. When finished, you can release a call by pressing the red phone icon.
- **Call Transfer:** (Cisco Call Manager Users Only) You can transfer a call to another telephone number by pressing the transfer button on the right of the active call window. You can conduct attended transfers, which allow you to notify and pass on information to the recipient of the transfer, or unattended transfers, which simply sends the call to the other party without providing additional information.
- **Directory:** Create directory entries yourself by clicking the "+" sign on the lower left of your screen. Click to Call also syncs with your Microsoft Outlook directory. In the Smart Search box at the bottom of the window, type in the name or number of the contact you would like to add. Click the arrow, then Favorite to add the contact to your directory.
- **Favorites:** Click the arrow next to each contact to add them to your favorites. These contacts will always appear in your directory.
- **Smart Search:** Use the Smart Search box at the bottom of the window to search for contacts by name or number. Call them directly from this window or add contacts to your directory.
- **History:** Access all dialed, recieved, and missed calls from the call history page. Users can return any calls from this page.



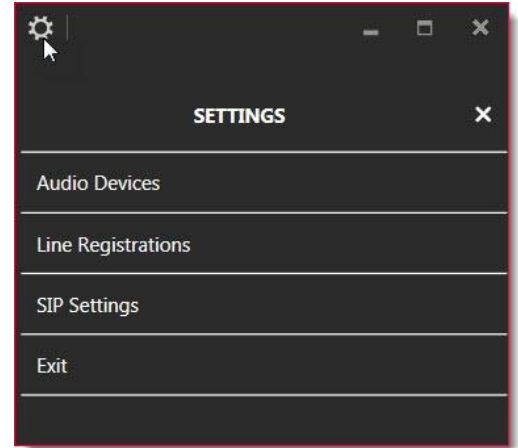
Click to Call Window

C9 TRADER USER GUIDE

5.1 Click to Call Settings

Click the gear icon in the upper left side of the window and the Click to Call Settings Menu will display.

- **Audio Devices:** Here you can select your microphone and speaker device for Click to Call. If a device is in use on the C9 Trader, then it ***will not*** be available for selection or use on Click to Call. The device will be greyed out in the drop down.
- **Line Registrations:** This indicates the current status of your line. A check mark indicates that your line or extension is registered and ready for use. If your line is not registered, contact your Administrator to modify your line registration in the Cloud9 Portal.
- **SIP Settings:** This tab shows your Session Initiation Protocol (SIP) Settings. If you need to change these settings, contact your Administrator to modify your SIP Settings in the Cloud9 Portal.
- **Exit:** To log out of your Click to Call window, select Exit and confirm that you would like to end your session. This will not log you out of your C9 Trader.



Click to Call Settings

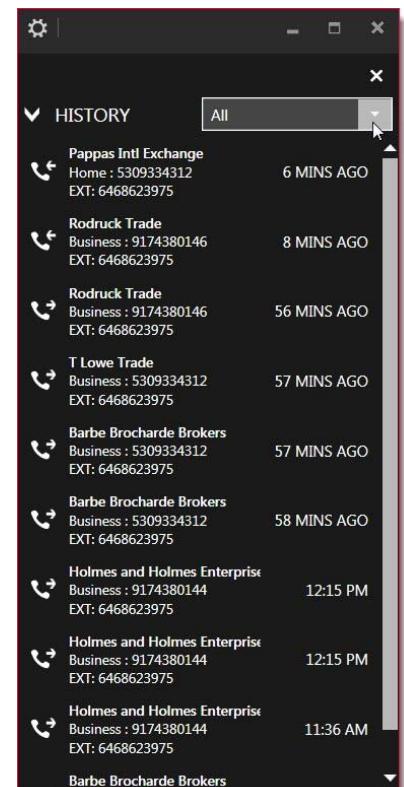
5.2 Click to Call History

Call History for Click to Call can be accessed by clicking on the icon next to the dialpad in the Smart Search Bar. This shows history of calls made and received only from Click to Call.

If a call has been missed, the call history icon will change color to teal. Once the history is viewed, the icon will reset to white. Call history is not saved between sessions and will be cleared upon exiting Click to Call.

By default, all call history will be displayed. Within the Call History page users can filter by the following call types:

- All
- Dialed
- Missed
- Received



Click to Call History

C9 TRADER USER GUIDE

5.2.1 Call History Return Call

Users can instantly initiate a call from the Call History page by selecting the return call button to the right of the contact. Once a user selects the return call button, they will be taken to the main screen for access to the additional call control buttons, i.e. Call Hold.

The following scenarios would prevent this option from being available to the user:

- The number is unknown
- The user's lines are not registered

5.3 Message Waiting Indicator

Users that are utilizing Cisco Call Manager and have voicemail supported within their environment can now get voicemail notifications through the Click to Call window.

Customers that are provisioned for voicemail, both within their network as well as the Cloud9 portal, will have a red Message Waiting Indicator on their Call History icon notifying users of new voicemail. A user can access their voicemail by selecting the Call History icon.

This Call History display includes all extensions provisioned for voicemail. A red dot indicates that new voicemail is available on that extension. Selecting an extension initiates a call to voicemail, and the user may be required to enter their PIN to retrieve messages. Users may also initiate calls to voicemail regardless if new messages exist.



Message Waiting Indicator

C9 TRADER USER GUIDE

6. Additional Features

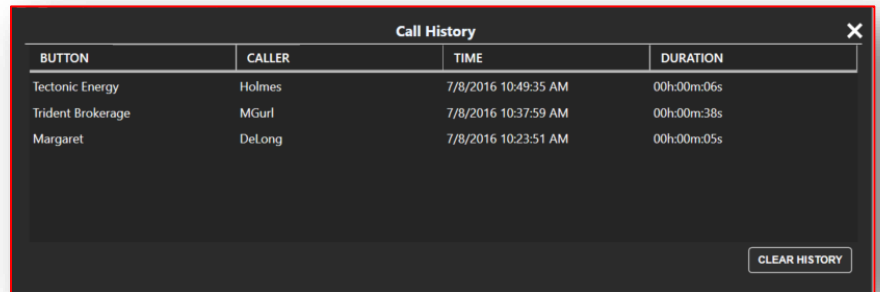
6.1 Call History

The Cloud9 application has a call history feature which enables you to see the call events that have occurred since you have logged into the service.

The Call History screen can be brought up by clicking the history button located within the control panel.

Call History data includes:

- Button Name
- Caller
- Timestamp
- Call Duration



BUTTON	CALLER	TIME	DURATION
Tectonic Energy	Holmes	7/8/2016 10:49:35 AM	00h:00m:06s
Trident Brokerage	MGurl	7/8/2016 10:37:59 AM	00h:00m:38s
Margaret	DeLong	7/8/2016 10:23:51 AM	00h:00m:05s

C9 Trader Call History

6.2 Privacy

If the Privacy feature is enabled on your account, you can turn it on for your ringdown connections. When Privacy is enabled, no one else from your own firm and group will be able to pick up the connection and participate in the conversation.

The Privacy feature is set in the Cloud9 Portal on a user by user basis. There are two ways that Privacy can be enabled in the portal:

- **Default on:** any time the user picks up a ringdown connection, Privacy is enabled
- **Default off:** you will need to turn Privacy on in order to prevent other users from participating in the conversation

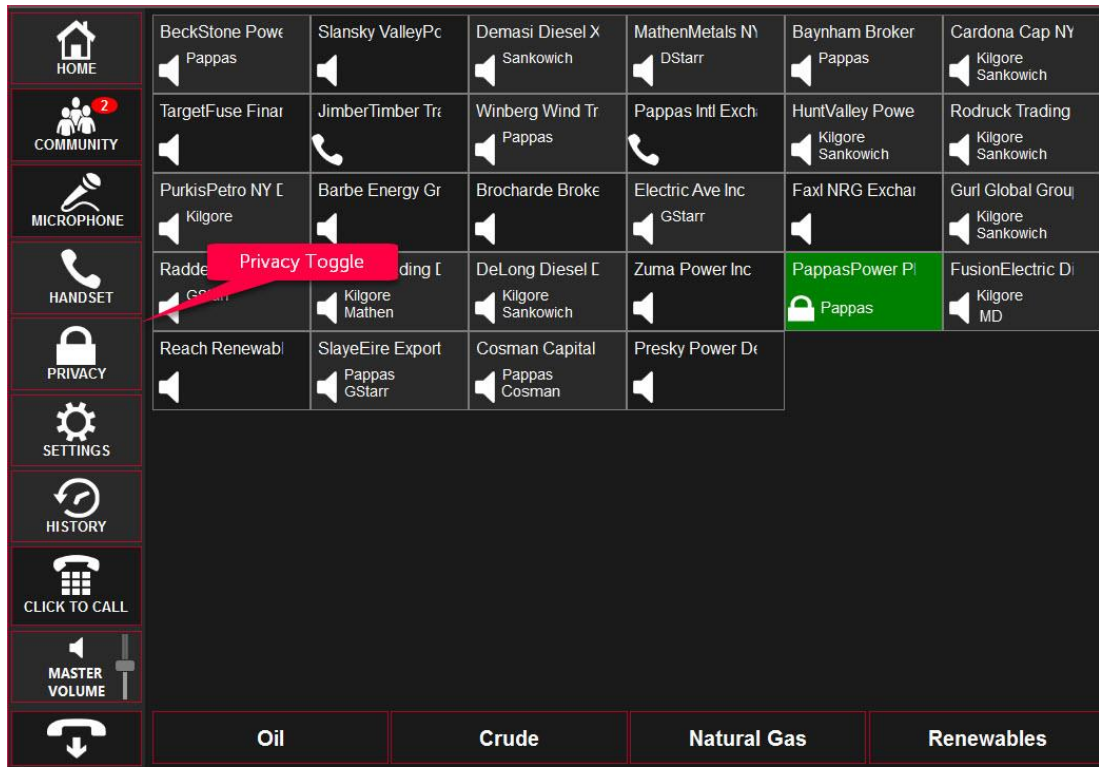
You are able to toggle the privacy on and off by clicking on the option in the control panel or by setting it as a toggle on their button board. When you disconnect from your ringdown, privacy will return to the default selection chosen in the portal.

C9 TRADER USER GUIDE

6.2.1 Privacy Status

A lock icon will appear on the button indicating that privacy is enabled for the call.

The phone icon indicates that privacy is not enabled and that the button is acting like a regular ringdown connection.



Call Privacy

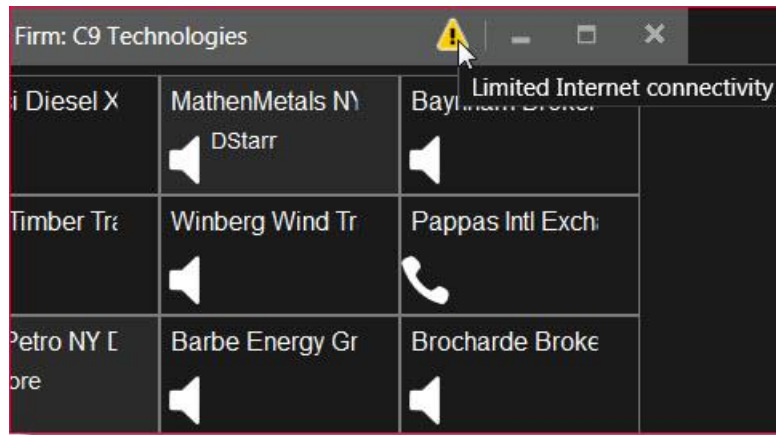
6.3 Performance Alerts

Performance alerts give C9 Trader users insight into factors that may affect their ability to use the platform. These notifications will indicate a user's network conditions such as internet connectivity and UDP connectivity.

- **Internet Connectivity:** The internet connectivity notification will alert users when internet connectivity conditions fall below an optimal range to support performance for the Cloud9. A yellow icon in the top right corner of the C9 Trader indicates a network warning, triggered when internet availability is between 60-80%. A red icon indicates a network error, when availability is between 0-60%.

C9 TRADER USER GUIDE

- **UDP Connectivity:** When the user logs in, the client will initiate a UDP (User Datagram Protocol) loopback test to verify the connectivity to the Cloud9 STUN servers. If the UDP loopback test fails, an error will be indicated on the login screen. In the event of any failure, the test will continue to try and establish a connection.



Performance Alerts

6.4 Audio Broadcast

The Audio Broadcast window can be accessed via a panel that slides out from the right side of the C9 Trader window.

Audio Broadcast Features

- Subscribe/unsubscribe for up to 20 predefined audio broadcast channels.
- Volume control settings for each of the 20 audio broadcast channels.
- Ability to hide/show the broadcast audio channel assignment window.
- All-channel mute feature for quickly muting all actively monitored audio broadcast channels.

Channel Subscribe/Unsubscribe

- **Subscribe:** Click the channel you wish to make active. The channel will turn green, a volume indicator will appear – showing the volume of the channel, and the broadcast will begin transmitting through your speakers.
- **Unsubscribe:** You can unsubscribe from an active channel at any time by clicking on the active channel.

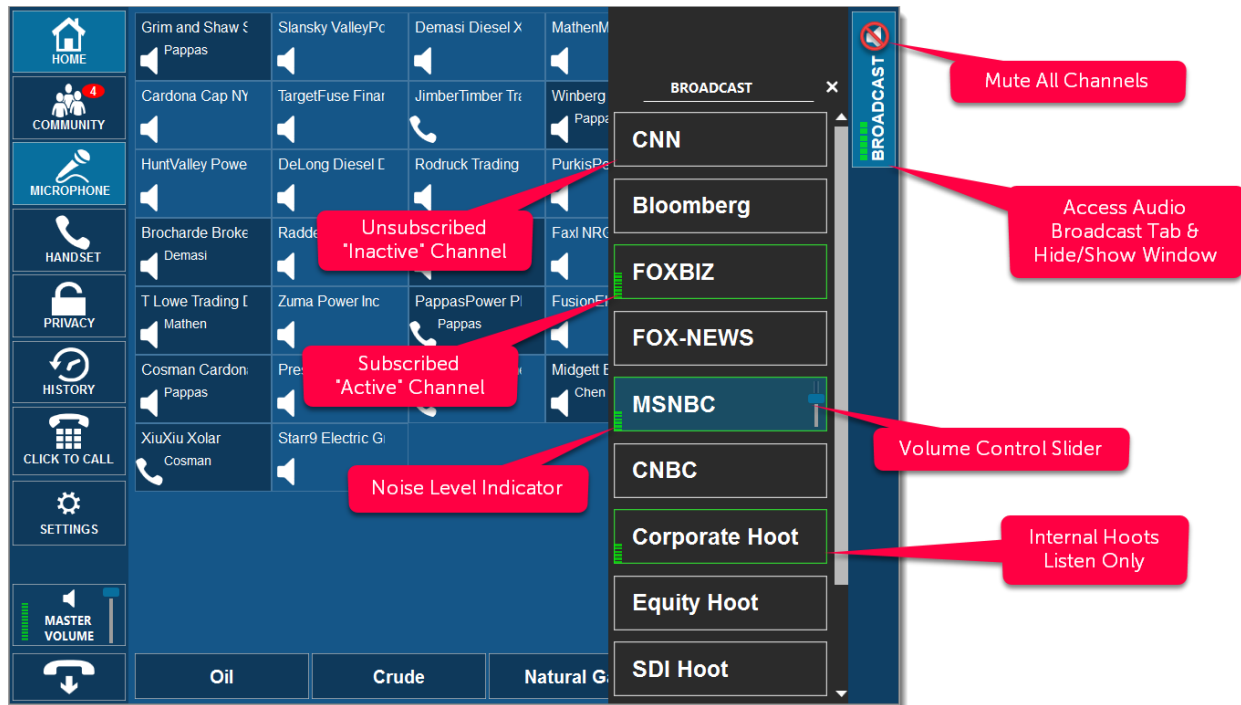
Internal Channels

If your organization has established internal channels, or "hoots" you can subscribe to these by clicking the assigned hoot in the channel list. Please note, these internal hoots are for listen only and do not transmit voice.

C9 TRADER USER GUIDE

Volume Settings

- **Individual Channel Control:** To adjust the volume for an individual channel, use the slider to the right of the channel button.
- **Master Volume:** The master volume button is positioned at the top of the Audio Broadcast tab. This tab remains visible when the Audio Broadcast window is in either an open or closed state. Users can mute all broadcast channels at the same time by clicking this button. To unmute the channels, click the button again.



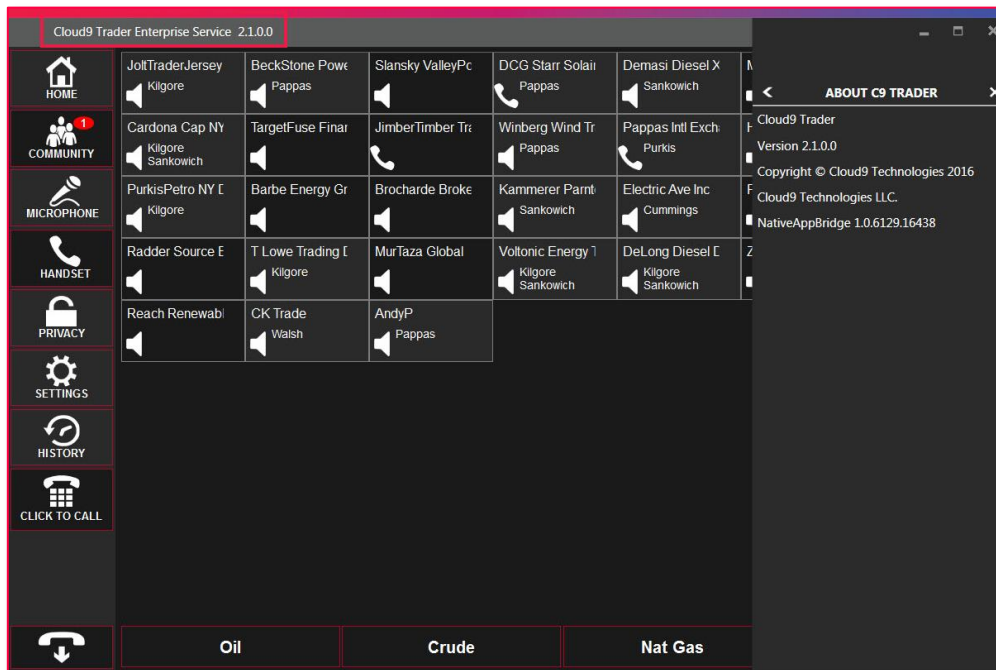
Audio Broadcast Panel

C9 TRADER USER GUIDE

7. Application Updates

Cloud9 maintains an active release schedule for new features and enhancements, so it is important to stay up to date with the latest release so you can take advantage of all the newest features. You can easily check which version you are running and whether updates are available by looking at the top right corner of the application window, or by selecting About C9 Trader in the Settings menu.

If an update is available, it will be applied silently every time the user logs into the application.



Application Updates

EXHIBIT

7



10 Steps to Getting Started on Cloud9 Trader

Let's get started!

Set up your Cloud9 application and revolutionize the way you trade in just minutes.



1 Welcome to the Community

Click the installation link in the email you received from the Cloud9 support team, and log in using your user name and temporary password provided in the email.



2 Sound Check: Setting Up Audio

In the **Audio Devices** tab of the Settings Menu, click the dropdown and select the devices you wish to use for the microphone, speaker and handset. Adjust the volume levels for all devices and set your notifications.



3 Making Connections: Find Your Counterparties

Go to the **Community** tab, select the community you belong to, and click the trading desk you would like to connect with. Use the Search function to find new counterparties. Next, click the invite button to create an invitation.



4 Let's Talk: Initiating a Call

Click a button to begin a call. When the counterparty responds, the button will light up and turn green. Hang up by clicking the button or the phone icon in the lower left of the screen.



5 Give a Shout . . . or a Ring

When creating a button, you're given the option to choose between a shout down or a ring down connection. This option can be customized for each connection.



6 Setting Up Buttons and Managing Invitations

After creating an invitation, name the button that will display in your Cloud9 window, and your counterparty's window.



7 All Together Now: Setting Up Group Buttons

Go to **Broadcast Groups** in Settings to manage group buttons, which enable you to shout down to multiple connections at a time.



8 Managing Your Buttons

Click on the **Community** tab, then select **My Buttons**. When you click on a button, you'll be able to see information relating to that button. Move the location of your button by dragging it to a new position the screen. To delete a button, click the trashcan icon.



9 Sorry I Missed You: Call History

Shows all calls that have taken place or that were missed during the time that you were logged into Cloud9. View call participants, date, time and call duration for calls.



10 Help! Contacting Support

In the settings menu, click Technical Support, to send an email to Cloud9.

Congratulations

You're ready to start using Cloud9!
How easy was that?!

EXHIBIT

8

REDACTED
IN ITS
ENTIRETY

EXHIBIT

9

C9 Trader System Requirements

To efficiently run the C9 Trader application, the operating system requirements as follows:

- Windows 7 or higher operating system
- Intel i5 or greater processor
- A built in sound device or USB sound device with playback (speakers) and recording (microphone). Cloud9 speaker and microphone devices are recommended, and have been optimized for the application.
- Internet access (wired or wireless)
- Google Chrome web browser
- When a user is not transmitting or receiving audio, Internet bandwidth consumption is negligible. When a user selects a Cloud9 button, the brief transmit process (seconds) will generate 80kbps/sec of Internet bandwidth per user.
- During peak traffic communications, the Cloud9 application should not consume more than 10-15% CPU performance.

Was this article helpful?

[YES THANKS!](#)

[NO, NOT REALLY](#)

Portal Basics

[\(/customer/en/portal/topics/104467-portal-basics-/articles\)](#)

Managing Firms

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Managing Groups

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Managing Users

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Managing Connections

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Managing Call Recordings

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Viewing Portal Logs

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Account Basics

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Button Presence Indicators

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[Calling Counterparties
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[Minimizing the C9 Trader on Your Desktop
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[Managing Application Settings
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managing-application-settings\)](#)

[Setting Up and Managing Broadcast Groups
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setting-up-and-managing-broadcast-
groups\)](#)

[Managing Audio Devices
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managing-audio-devices-\)](#)

[Managing Notification Settings
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trader-system-requirements\)](#)

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making-a-call/articles\)](#)

[Click to Call
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click-to-call/articles\)](#)

[Audio Broadcast
\(/customer/en/portal/topics/107512-
audio-broadcast/articles\)](#)

[\(/customer/en/portal/topics/104892-managing-audio/articles\)](/customer/en/portal/topics/104892-managing-audio/articles)

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[Multi-Device Support](#)

[\(/customer/en/portal/topics/109456-multi-device-support/articles\)](/customer/en/portal/topics/109456-multi-device-support/articles)



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